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## FOREWORD

### HELPS IN BUILDING SPEECH FOR THE DEAF

The ideas presented here are the outgrowth of study with many leaders in the field of voice and speech production for both the normal speaker and the deaf; and the application of reading in my school.

Victoria Cameron Jesseman

(B.L.I Emerson College, 1931)

in an effort to keep the development in mind for speech improvement; and of many years' experience with pupils ranging in age from four to twenty-four. No originality is claimed for the work other than possibly the manner of application of the principles of voice production and speech to the deaf.

A thesis submitted to Boston University  
in partial fulfillment of the  
requirements for the degree  
of  
Master of Education

and the manner in which it is set forth. The helps are intended to be suggestive rather than mandatory or exhaustive.

#### Readers:

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HELPS IN BUILDING SPEECH FOR THE DEAF

BY

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School of Education

Aug. 13, 1941

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Master of Education

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The ideas presented here are the outgrowth of study with many leaders in the field of voice and speech production for both the normal speaking voice and as applied to the deaf; of reading in my chosen field and attendance at conventions in an effort to keep informed on the latest development in aids for speech improvement; and of many years' experience with pupils ranging in age from four to twenty-four. No originality is claimed for the work other than possibly the manner of application of the principles of voice production and speech to the problem of the acoustically handicapped, and the manner in which it is here set forth. The helps are intended to be suggestive rather than mandatory or exhaustive.

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3. Method of approach

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a. In syllable

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1. The Apocrypha, Ecclesiasticus VI: 24.

2. Max A. Goldstein, Problems of the Deaf, The Laryngoscope Press, 1933, p. 15.

3. Ibid., p. 14.







## INTRODUCTION

This is a hearing world where communication is carried on largely by means of the spoken word, each person using the type of speech which he has heard and learned subconsciously from his environment. Without hearing, therefore, there can be no speech acquired in the normal way. It is generally accepted, however, that oral expression is necessary to the best mental development of the individual. A writer of very ancient times said, "For by speech wisdom shall be known: and learning by the word of the tongue."<sup>1</sup> While this apparently applied to those who had hearing, for history reveals to us that in olden times the deaf were considered incapable of learning,<sup>2</sup> it is accepted to-day to be true of the deaf also.

The idea that speech could be a medium of communication for the deaf, as opposed to the use of signs or finger spelling, is not of recent origin. Since 1578 there have been those who have sought to bridge the chasm between society and the individual who is set apart because of deafness, by teaching him to express himself orally.<sup>3</sup> The road

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1 The Apocrypha, Ecclesiasticus V: 24.

2 Max A. Goldstein, Problems of the Deaf, The Laryngoscope Press, 1933, p. 13.

3 Ibid., p. 14.







from then to now has been a checkered one for the oral, and more recently the acoustic, method of teaching the deaf, and the struggle is not entirely over, for there are still those who would relegate the importance of speech for the deaf to the background. It seems reasonable to believe, however, that with the ever-increasing use of the electrical instrument as an aid toward better voice and articulation, the opposition to the oral and acoustic method of education for the deaf will be overcome eventually.

The first oral school for the deaf in the United States to be established by act of legislature was at Northampton in 1867, and was brought about by the efforts of certain public spirited men, notably the Honorable Gardner G. Hubbard, whose little daughter, Mabel Hubbard, in after years the wife of Alexander Graham Bell, became deaf at four years of age. This school is now known as the Clark School for the Deaf. In 1869, also by act of the Massachusetts State Legislature, the first day school for the deaf was started in Boston, later becoming known as the Horace Mann School for the Deaf. It, too, was to be an oral school, and marked a further step in the progress of the education of the deaf, inasmuch as up to this time it had been thought necessary for children handicapped by deafness to be taught in a residential institution. "The Horace Mann School has proved by its continued and growing success that to deaf as well as to others all the advantages of school education can be extended







without the severance of home and family ties."<sup>1</sup> There are one hundred thirty-three day schools for the deaf in this country to-day, Michigan and Wisconsin leading with twenty-one and twenty-three, respectively.<sup>2</sup>

Oralism in this country received great impetus through the interest of Alexander Graham Bell, who not only instructed the early teachers of the oral method in voice production and formation of elements of speech, but was also a regular attendant at their conventions, argued eloquently regarding the necessity of speech for the deaf, and demonstrated its possibilities.

The education of the congenitally deaf, and the one who becomes deaf before the acquisition of speech and language, is a distinct problem from that of the child who becomes deaf after he has learned speech and language. The two should not be confused for, with the help of lip-reading and perhaps speech lessons, the education of the latter can proceed along the same lines as those for hearing children.

The purpose of this thesis is to set forth a method for a logical development of the speech processes of both the congenitally deaf child, and the child adventitiously deaf before speech has been learned, the ultimate aim of which is to give to those thus handicapped the ability to communicate

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1 Mabel Gardner Bell, The Story of the Rise of the Oral Method in America, Washington, D.C., W. F. Roberts Press, 1898, p. 46.

2 American Annals of the Deaf, Vol. 36, Jan. 1941, p. 21.







orally in a manner that will be understood easily by society.

To better understand the problem of teaching speech where the avenue of hearing is closed, it may be well to keep certain facts in mind. The first is that speech, as Dr. James Kerr Love has said, "is the expression of thought by articulate movements," and that "the memory of words spoken is largely a memory of movements made by the muscles of articulation, and must be distinguished from the memory of words heard."<sup>1</sup> So, while the hearing child learns speech from imitation of what he hears, the deaf child must learn from imitation of what he sees and feels, with perhaps some help from a degree of residual hearing; and whereas the hearing child's speech becomes automatic through subconscious effort, the deaf child's speech must be learned by conscious repetition until it becomes automatic. Continued repetition of syllables, words, phrases and sentences until fluency is attained will not only make speech pleasurable, but also, when learned to this degree, will make possible its successful use as a medium of communication.

The objectives in teaching speech to the deaf are to produce a clear, resonant voice and fluent articulation. To obtain these objectives there must be firm support of the outgoing breath, an open throat, relaxed muscles, free resonance chambers, and direction of tone to a focal point.

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<sup>1</sup> James Kerr Love, M.D., The Deaf Child, New York, William Wood Company, 1911, pp. 28-33.





There must be a definite distinction between the nasal elements and those that come through the mouth, with a facile blending of these elements, phrasing, rhythm, and to some degree, inflection. These points, together with the use of hearing-aids, and suggestions for co-operation in the home, will be discussed in the following pages. An effort has been made to present the subject in definite, concise and non-technical terms intelligible to the inexperienced teacher who has a theoretical background but little practice, or to parents who wish to be informed so that they may more intelligently help the child in the home.

In teaching speech to the deaf, the first thing to remember is that the deaf child, except in unusual cases, has exactly the same organs for the production of speech that the hearing child has. The second thing to remember is that his speech can be no better than the ideal we have for him, and no better than the pattern which we give him to follow. If he fails, it is because we have failed in one or more of the following ways: (1) by underestimating his ability to learn; (2) by not having the correct pattern in our own mind; (3) by failing to convey to him a correct concept of the pattern; (4) by not having our ear attuned to shades of differences;





## I

### BREATH: THE FOUNDATION OF SPEECH

Speech, as has been stated, is the medium by which hearing individuals exchange their ideas one with another. We accept this power without question, and it is only when we come in contact with those who are limited for one reason or another in their ability to express their thoughts by the spoken word that we realize what a precious gift we have in speech, or how marvelous is the instrument that produces it. The deaf child, never having heard, does not use this medium of speech for expressing his thoughts until he has been taught in a more or less artificial way to do so.

In teaching speech to the deaf, the first thing to remember is that the deaf child, except in unusual cases, has exactly the same organs for the production of speech that the hearing child has. The second thing to remember is that his speech can be no better than the ideal we have for him, and no better than the pattern which we give him to follow. If he fails, it is because we have failed in one or more of the following ways: (1) by underestimating his ability to learn; (2) by not having the correct pattern in our own mind; (3) by failing to convey to him a correct concept of the pattern; (4) by not having an ear attuned to shades of differences;







and (5) by not giving sufficient repetition to establish the new habit. It is most important that the child be given the right pattern at the start so that wrong habits will not have to be broken, and new ones learned. The difficulty of breaking old habits of speech and the forming of new ones in the work of speech correction for hearing children is well known and readily understood; the difficulty is greatly increased where there is no hearing to guide, and where the kinaesthetic, or muscular sense, must be relied upon in the forming of the new speech habits. Therefore, it is evident that the initial steps in the speech building process must be undertaken with great care.

All speech is dependent upon breath for its production: breath vocalized or unvocalized. "Breath is the motive power on which voice depends."<sup>1</sup> It is outgoing breath setting the vocal cords in vibration that produces voice. It is this outgoing breath, vocalized or unvocalized, motivated by the speech center of the brain, and molded by the organs of articulation, that results in speech. Since, therefore, "breath is the motive power on which voice depends," our first consideration must be of the apparatus by which breathing is accomplished.

There are two movements in breathing — inspiration

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1 William H. Kenney, Notes on Breathing, p. 1.

1 Sir Mervin Mackenzie, Systems of the Vocal Organs, New York, Warner and Company, 1892, p. 213.







and expiration; together, the movements are called respiration. The chief organs of respiration are the lungs:<sup>1</sup> a right lung with three lobes, a left with two. They consist of spongy air cells, and are cone-shaped, with the narrowest part at the top. The base of each lung rests on the diaphragm. The bronchial tubes branch from the trachea and divide and subdivide into smaller tubes, ending in tiny air cells, where most of the air that is taken in during inspiration is changed from oxygen to carbon dioxide, and is expelled from the lungs during expiration. It is on breath expelled during expiration that speech depends.

The lungs are enclosed in the thoracic cavity, together with the heart. This thoracic cavity is surrounded by a strong protective framework, the ribs, twelve in number on each side, which are attached to the sternum in front and the spinal column in back. This framework is made elastic by means of muscles and tendons between and surrounding the bony walls of the thoracic cavity. These intercostal muscles are of two kinds, the external, active in inspiration, and the internal, active in expiration. Their movement is lateral. There are other sets of strong muscles which assist in raising and lowering the ribs. The lungs depend upon the movement of this muscular framework for their power of expansion and contraction, having no power of themselves for this purpose.

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The diaphragm is the large muscle which separates the thoracic cavity from the abdominal cavity, and upon which the base of the lungs rests. Diaphragmatic control of the breath is the foundation of all good speech, since its pressure against the base of the lungs supports and controls the outgoing breath. In ordinary conversation, as contrasted with public speaking, the average person tends to use his diaphragm correctly; but, unless the teaching of speech to the acoustically handicapped is begun before the age of five or six, it will be necessary to teach the correct use of the outgoing breath for speech purposes.

Air taken into the lungs through the nose passes down through the larynx into the trachea below the larynx, and from thence into the bronchus and bronchial tubes.

Situated at the top of the trachea, or windpipe, is a marvelous little instrument which man has appropriated for speech purposes, known as the larynx. Recent research suggests that the larynx originally was not intended for speech purposes. In his introduction to Mechanism of the Larynx by V. E. Negus, Sir Arthur Keith says,

Negus does not regard the human larynx as purposely designed for speech. He recognizes that speech is a faculty of the brain; when man's brain became capable of expression, it used the larynx because it was the most convenient at his command.<sup>1</sup>

The larynx is situated in the front of the neck, and

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<sup>1</sup> St. Louis, C. V. Mosby Company, 1931.







forms the prominence sometimes called "Adam's apple." It is triangular in shape, narrow above, and broader below. It is composed of cartilages which are moved by attached muscles.

Within the larynx are the vocal cords, or bands, — little shelves of muscle tissue attached to the walls of the thyroid cartilage. This muscle tissue extends from front to back, its inner edges being free. The space between the vocal cords is called the glottis. When the stream of breath about to pass over these little bands of tissue is motivated by the speech center, the muscles controlling their action bring the edges together, and when they separate the breath, as it passes through the glottis, sets the edges in vibration, resulting in the sound we know as voice. The strength of the voice depends upon the pressure of the diaphragm against the column of air which is passing out of the lungs. It is the nice approximation of the vocal cords that the teacher of speech to the deaf must strive for in order to obtain a good quality of voice. Regardless of what method is used for teaching the adjustments of the articulatory organs, voice can be produced in only one way: that is, by a steady, well-controlled pressure of breath from below, setting the delicate edges of the vocal cords in vibration. The contact of the edges must be just enough to give a clear fundamental tone, and the pressure of breath only as much as is needed for the particular element to be produced. If the vocal cords are not brought together closely enough, too much breath will escape







with the voice, and the result will be a breathy fundamental tone. If, on the other hand, they are brought together with constriction of the muscles controlling their action, the supply of breath will be shut off, and a pinched fundamental tone will be the result.

So far we have spoken briefly of the apparatus used in the production of voice. Voice is molded into speech by the organs of articulation. The organs of articulation are lips, upper gum, hard palate, soft palate, tongue, and teeth. The lips need no explanation. They are there as a door through which the voice is to pass, but their shape determines in some measure the type of sound that will pass through. The upper gum, variously termed alveolar ridge and teeth ridge, is the point where the teeth grow out of the gum. The hard palate or roof of the mouth separates the nasal cavity from the oral cavity, and acts as a reflector and resonator of sound. The soft palate is the soft part beyond the hard palate which drops down in normal breathing, resting lightly on the back of the tongue. The little appendage attached to it is the uvula. The soft palate is a very important organ of articulation, and in order to have good speech it must have definite action. Lastly, though by no means the least in importance, the tongue, a mass of muscle, is attached at the root to the hyoid bone, a little above the larynx, and is also attached by muscular fibres and connective tissue to

1 Mackenzie, *Hygiene of the Vocal Organs*, p. 234.



with the voice, and the result will be a pleasing fundamental tone. If, on the other hand, they are brought together with contraction of the muscles controlling their action, the supply of breath will be shut off, and a pinched fundamental tone will be the result.

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the lower jaw in front and on the sides.<sup>1</sup> The control of the tongue in speech is all important. It must be flexible at all times, but it must also move with precision from point to point.

The breath passing over the vocal cords, motivated by the brain, as has been said, produces voice which in turn is molded into speech by means of the organs of articulation mentioned above. However, before there can be a pleasing voice, another element must be taken into consideration. A fundamental tone by itself would not be agreeable to the ear, as it would be hard and metallic. There are certain spaces back of, above and below the larynx into which the voice enters, giving to it the quality known as resonance. This quality reinforces and beautifies the voice in the extent to which it is developed. The resonance spaces, or chambers, are the chest with trachea, larynx, pharynx, nose and mouth. The wall that can be seen back of the mouth when it is opened wide enough, and extending down to the larynx, is the pharynx. Extension of the same wall above the soft palate, and back of the nose, is the naso-pharynx. The nares are the cavities in the head extending through the nose to the pharynx. The mouth, the spaces of which will vary according to the vowel produced, also acts to reinforce the fundamental tone. In the head will be found spaces in the bony structure called

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1 Mackenzie, Hygiene of the Vocal Organs, p. 234.







sinus. It is thought that these, too, act as resonance chambers, but the largest resonance chamber is the mouth.

We have said that all speech requires breath for its production, breath vocalized or unvocalized, and we have considered the agents active in breathing and the formation of speech. We come now to a consideration of how breath is directed and controlled for speech purposes.

In breathing for speech purposes, there are two objectives: (1) to increase the capacity of the lungs, and (2) to control the emission of breath.<sup>1</sup>

In teaching acoustically handicapped children to speak, it is well to remember that we are not training them for public performance, but for normal conversation. Therefore, we are not concerned so much with quantity of breath as with its controlled emission. The process of breathing for speech purposes is as follows: In inhalation air is taken into the lungs, the ribs move up and out, the diaphragm lowers, and the abdominal wall expands, thereby enlarging the thoracic cavity. In exhalation the breath is controlled in its outward passage from the lungs by the diaphragm which, if properly controlled, pushes the breath out in a steady stream.

The normal hearing child uses his breath naturally when speaking; though there is no doubt but that his voice

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<sup>1</sup> Kenney, Notes on Breathing, p. 1.

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1 Kenney, Notes on Breathing, p. 1.



quality could be improved by giving some attention to the two objectives under consideration. With the deaf child, however, development of these objectives is essential. To give to a young child formal exercises in breathing, such as one would use in developing capacity and control for public speaking, is not wise because there are possibilities that wrong conceptions may be learned. A better way for bringing about capacity and control of emission of breath is that which would be in the nature of play. An excellent means toward this end is to provide the child with different objects to blow. For the baby, as soon as it is discovered that he is deaf, tiny feathers of bright colors will be attractive. Taking the child on the lap, let him see you blow the feather. Then hold the feather close to his lips, and encourage him to blow. Let him feel the spirit of play. Gradually increase the distance of the feather from the lips. To blow at the increased distance, it will be necessary to take more air into the lungs, and the process will also call for greater activity on the part of the diaphragm. Larger feathers may be used later on. When the child is old enough to run about the room, let him do so while trying to blow a feather. As he grows older still, he may be given the smallest-sized blowout. A collection of these blowouts should be on hand, of various colors, if possible, for interest. Besides blowing out in short puffs, he should be taught to hold it extended. A game can be made of it by counting for







the length of time it can be held thus extended. In order to do this the child will subconsciously discover that it is necessary to take deeper and deeper breaths, and he will do so automatically. The diaphragm will also become increasingly strong in its support of the breath. If there are several children to play the game, score may be kept, the one who is able to hold his out the longest being the winner. As power increases, larger blowouts may be used in the same way.

Pinwheels, balloons of various sizes and shapes, objects to stand up and blow down, such as paper dolls and lightweight tin soldiers, are all good for increasing and controlling the breath. The object should be stood on the edge of the table and blown off, letting it fall on the floor for the exercise of picking it up. The distance from which the object is blown may be increased as rapidly as possible. The number of times it can be blown over in a minute or two may be counted, and score kept.

A parachute blowout, to see how high into the air it can be blown, is another good toy for this purpose. Whistles, bubble pipes, an harmonica, especially if there is any residual hearing, and paper bags of various sizes which may be blown up but not exploded until the end of the blowing period when it may be exploded for satisfaction, may also be used.

For those living in the country, nature offers many things to blow, such as the fluffy down of dandelions and



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milkweed pods, or even a blade of grass.

The older children will enjoy the time-honored candle brought up-to-date in a pretty holder, with the color of candle varied according to the season. In this exercise the flame can be blown out at increasing distances which will increase the capacity of the lungs, and the small blue flame held for control of emission of breath. For the explosive elements, the flame may be puffed.

These exercises teach in a pleasurable way the fundamental principle of the outgoing breath well supported and controlled by the diaphragm and assisting abdominal muscles. They increase the lung capacity, and exercise the many muscles that have to do with the formation of speech. The soft palate, too, the activity of which is so essential to clear voice, but which in the case of acoustically handicapped children is not used except when eating, automatically receives its share of attention by means of these blowing exercises. With small children this incidental exercise of the soft palate is preferable to making a conscious effort to move the palate up and down while watching its reflection in a mirror. To acquire a conscious control of the soft palate with the use of a mirror may be successful with older children; but with little ones the less attention that is called to the individual parts of the speech organs the better.

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two classes, breath consonants and voice consonants.

The breath consonant sounds are h, wh, p, b, k, f, th, s, sh and ch.

## II

The voice consonant sounds are m, n, d, g, v, th, z, sh, j, l, r and y; w, a and ng.

### USE OF BREATH IN SPEECH

Voice is one thing — articulation, another, though the two are interdependent. A person may have good voice quality and yet have poor articulation. On the other hand, a person's articulation may be understandable, but his voice be of poor quality. The sound that originates in the larynx may be called voice. The formation or molding of this sound by the organs of articulation, reinforced by the resonance chambers, and motivated by the speech center of the brain, constitutes what we call speech.

All of the elements which are used in the formation of speech are not vocalized. They may be unvocalized, and yet remain true speech, as, for example, in the whisper. Speech sounds are divided into two classes, vowels and consonants. A vowel in its truest form is always wholly vocalized breath coming through an unobstructed mold. A consonant, on the other hand, may be a vocalized or unvocalized, partial or complete, obstruction to the outgoing breath at some point in its passage through the oral cavity. It is only in the consonants, therefore, that we find the elements that are unvocalized. English consonants are divided into





two classes, breath consonants and voice consonants.

The breath consonant sounds are h, wh, p, t, k, f, th, s, sh and ch.

The voiced consonant sounds are w, b, d, g, v, th, z, zh, j, l, r and y; m, n and ng.

All consonants, whether vocalized or unvocalized, are of two kinds, stops, sometimes called plosives or explosives, and continuants.

If breath, either vocalized or unvocalized, is stopped as it is passing through the mouth, and then released quickly with a slight explosive sound, so that it can continue its way out through the mouth, the sound thus produced is called a stop, plosive or explosive. The breath stop consonants are p, t, k and ch; the voiced, b, d, g and j.

If the breath, instead of being stopped, is merely hindered somewhat in its passage through the mouth, or diverted from the mouth and sent through the nose, the sound thus produced is called a continuant. Breath through the nose, vocalized, results in the sound of m, n or ng. It will be noted then that all continuants whether voiced or unvoiced are directed through the mouth except m, n and ng. It is in the change from these nasal elements to the oral elements that the soft palate must be active.

For convenience, therefore, we will group our consonant sounds as follows:





## CONSONANT SOUNDS

### Continuants

<u>Breath</u>	<u>Voice</u>	<u>Voice through the nose</u>
wh	w	m
f	v	n
th	th	ng
s	z	
sh	zh	
h	l	
	r	
	y	

### Explosives

p	b
t	d
k	g
ch	j

qu (kwh)

x (ks)

1 "The Importance of the Consonants in Speech and Speech-Reading," The Association Review, Vol. XL, Dec. 1922.

2 The Voice: How to Use It, Part II, Boston, Expression Company, p. 34.





In regard to the necessity for accurate consonant elements, produced with the correct force and balance of breath and voice, A. J. Story says:

It has been pointed out, times without number, that in the production of good and intelligible speech the full force and value of its necessary consonantal sounds must be faithfully given.... Certain points of the modifying organs must be applied, or approached toward certain points of the speaking mouth; and the application or approach of other points of these organs, or the application or approach of the correct points to incorrect points of the speaking mouth, at once spoils the quality of the resultant sound and either reduces or obliterates intelligibility. The truth is that the proper enunciation of the consonantal sounds depends upon the almost exact placement and movement of the articulating organs, and only a comparatively minor range of inaccuracy in placement and action is permissible without injuriously affecting the audibility of such sounds or lowering their quality to the point of unintelligibility.<sup>1</sup>

Barrows and Pierce in a chapter on "Exercises for Articulation" say:

In the production of consonants we must be careful to make the obstruction correctly; for on the place and degree of this blockage the quality of the consonant largely depends. We must be careful also not to unvoice consonants which should be voiced, nor to voice consonants which should be breathed.<sup>2</sup>

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1 "The Importance of the Consonants in Speech and Speech-Reading," The Association Review, Vol. XL, Dec. 1909.

2 The Voice: How to Use It, Part II, Boston, Expression Company, p. 35.







The congenitally deaf child, and the child who becomes deaf before he has learned speech, face the same problem in learning the spoken word; that is, both are dependent for their speech impressions upon what they can see and feel. A glance at the above classification of consonant sounds will show that each breath consonant has one or more corresponding voiced sounds. This means that a group of from two to four elements will have the same point of contact but a different application of breath. However, the deaf child neither sees nor hears this difference. To him the elements of a given group will look the same irrespective of whether the sound produced is breath or voice, or voice through the nose; or whether it is a stop consonant, like t or d, or a continuant like n or l. When the child is first learning speech he will feel these differences in application of breath or voice by placing the tips of his fingers on the teacher's cheek and before her lips; but as he grows older and is dependent wholly upon lip-reading, he may forget that these consonant sounds that look alike must be sounded differently. A consciousness of these differences must be well established in the beginning, and kept before him continually as his education proceeds or his speech will be quite unintelligible except to those who know him.

An effective way of establishing this consciousness with beginners or re-establishing it with those of any advanced age who have never sensed the proper vibration with the right







direction of breath in these nasal elements is to objectify the outgoing breath by using a strip of paper. The strip of paper — say, two and a half inches long by one-half or three-quarters of an inch wide — should be held about two inches from the lips. When a breath element is given, the child will see that the paper bends over or is vibrated for a breath consonant, that this does not happen with the voiced sounds, and that in certain sounds there is a combination of both breath and voice. Exercises such as the following, providing for repetition of consonant sounds, may be used for this purpose. The position is prolonged for f, th, s, sh, etc. and held in the case of p, t, k, ch and their corresponding voiced elements before it is released; and it is important that the amount of breath be of the same force and duration at each repetition of the consonant sound. At first only the indefinite vowel ũ is used, as this will call for no effort of the tongue. Later, other vowels may be substituted, preferably the short ones. A suggestion for such drill follows:

f ũ

th ũ

f uf

th uth

f uf uf

th uth uth

f uf uf u

th uth uth u

f uf uf uf u, etc.

th uth uth uth, u, etc.





S and sh will be used in the same way, and all should be continued for as many syllables as can be done on one breath, being careful to keep the force and duration of the consonant element constant throughout the series. This should be followed up by words using these consonant sounds.

As skill in this exercise is acquired, the consonants may be interchanged; e.g., f us uf us u, etc., always holding the consonant sound, and making the vowel very short. Sometimes the drill may begin with the vowel initial instead of the consonant.

The same procedure may be followed using the voiced consonants, either continuants or explosives, and then the breath and voiced consonants interchanged.

When re-establishing a consciousness of the difference between breath and voice consonants, it will not be necessary to use the strip of paper longer than to illustrate. After that the pupil must remember the amount of effort necessary to make the breath sound audible to the normal ear. The teacher should listen carefully, and refuse to give approval unless this is done. On the other hand, in beginning speech the use of the strip of paper will be a part of the daily routine for objectifying the difference between breath and voice consonants. For variation, different colored strips may be used on different days. Soft feathers may be found attractive, or any other device that may suggest itself.





The need for objectifying to the acoustically handicapped child the difference between the breath and voice consonants will thus be met, and practice should be continued over many years until the differences are permanently established in his consciousness, and his response has become automatic.

The English language has only three elements, all belonging to the consonant class, in which the soft palate is lowered from its otherwise habitually high position, allowing the sound to be deflected through the nose. These are m, n and ng. All other speech sounds must come entirely through the mouth. The normal child hears these differences; the deaf child must be taught to sense them.

There are several reasons why m, n and ng should be used as a starting point in the teaching of speech to the deaf. In the first place, these three tones are considered as of prime importance for improving the normal speaking and singing voice. In his book, Voice Culture, Dr. Charles W. Emerson says:

The first object in the cultivation of the voice should be to establish habitual openness and freedom throughout the vocal aperture and this, too, by the shortest possible method. This method should consist...in securing a unified action of all the parts.<sup>1</sup>

m, n and ng are the elements best suited to this purpose. The focal point to which, in the case of the deaf, that tone should

<sup>1</sup> Boston, Mass., Emerson Publishing Company.





### III

#### M, N AND NG

The English language has only three elements, all belonging to the consonant class, in which the soft palate is lowered from its otherwise habitually high position, allowing the sound to be deflected through the nose. These are m, n and ng. All other speech sounds must come entirely through the mouth. The normal child hears these differences; the deaf child must be taught to sense them.

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1 Boston, Mass., Emerson Publishing Company.





be directed may be the lower edges of the nostrils. If the voice is properly directed to this point, "all the resonant passages open freely through the entire nares, mouth, and pharynx to the vocal cords."<sup>1</sup> The tongue, too, will be in its normal position. The tone thus focused will vibrate freely with the least effort. This use of the nares elements also forces the vibrating air into the resonance chambers, thereby beautifying the tonal quality.

The transition from the nares tones to all other speech sounds requires a great deal of practice. The younger the child is when he begins to learn speech, the easier this will be to do, because the soft palate, upon the activity of which so much depends, has been inactive for so long a time. If, preceding this, he has had a period wherein he has subconsciously learned direction and control of breath by blowing, as explained before, the soft palate will be in a flexible condition, and will lend itself readily to the demands to be made upon it.

The teaching of these elements will not be difficult if approached with care. By means of blowing, direction of breath through the mouth has already been learned. Holding a slip of paper vertically before her own lips, and with her lips rounded as though saying some word beginning with wh, the teacher will gently allow as much breath to escape as will

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1 Emerson, Voice Culture.







bend the paper over. This should be repeated several times. Then, she will hand a similar slip of paper to the child, and invite him to imitate what she did. Before the pupil rounds his lips, however, she must make sure that the tip of the tongue is back of the lower teeth, and completely fills the space from side to side. The pupil's attention should not be called to the position of his tongue unless the teacher notices that it is retracted, in which case she must encourage him to bring it forward before she allows him to round the lips. In all this she must be entirely relaxed herself, and see that the pupil is, too. Then the child will be encouraged to blow the paper gently as he has seen the teacher do, prolonging the process at first, and when that step is fairly established, doing the same in a series of short emissions, several on one breath, increasing the number as time goes on. A short emission of outgoing breath through the rounded lips will produce the breath sound of wh.

Next, take a strip of paper, and holding it in a flat, horizontal position under the nostrils, with lips closed, gently blow the breath through the nose until it bends the paper downward. In this second process, before the lips are closed, be sure that the tip of the tongue is back of the lower teeth, and broad enough to fill the entire space from side to side in the same way as for the first blowing position, that it is thoroughly relaxed, and







that, although the lips are closed, the teeth are slightly separated. This is all very important for it will prevent constriction of muscles when it comes time for phonation. Now alternate the gentle blowing of the strip of paper until it bends, first through the rounded aperture of the lips, and then through the nose.

For the third step, place the strip of paper in a flat, horizontal position under the nostrils, this time with the lips open, the teeth separated the width of the tip of a finger, and the tongue raised to the hard palate at the place where the teeth grow out of the gum, as though about to say "No." With the tongue in this position again blow the strip of paper until it bends downward. Now alternate these three positions, still using the paper to show direction of breath.

When the child sees that, with the tip of the tongue down, the paper does not move when he breathes through the nose, he will try to make it do so, and the effort after a time results in the back of the tongue responding by rising to the ng position. While it is best to induce the movement of the paper by the outgoing breath through the nose without drawing attention to the fact that the back of the tongue is raised, if, after some weeks of daily attempts, the back of the tongue





does not respond, the teacher may allow him to look into her mouth and see the raised position; but, again, the less attention called to specific positions, the more natural the results. Care must be taken when inducing this movement to make sure that there is no rigidity of the tongue, and that it fills the space in the oral cavity from side to side.

Up to this time we have been showing with breath the direction the tone is to take. The teacher should train her ear to detect any sound in the outgoing breath that indicates an obstruction to its free flow. Such sound will mean that in all probability there is constriction of the back of the tongue. One way in which this may be overcome is to place the thumb and forefinger gently under the nostrils of the child, and require him to breathe through the mouth. This will quickly bring the tongue into normal position. Then, removing the thumb and forefinger, replace the strip of paper, close the child's mouth gently, and again induce him to blow through the nose. This procedure must be repeated until the sound of the outgoing breath shows that it is entirely free. We are now ready to apply voice.

The child will be taught next to hold the strip of paper with the thumb and forefinger very lightly under the teacher's nostrils, but not quite touching the edge of the nostrils in order to allow a vibrating space. The child will feel the vibration of the paper when voice is





applied. The teacher will alternate breath and voice, encouraging the child to feel the difference. When she thinks that the child senses the difference, the child will be allowed to apply a strip of paper to his own nostrils, and attempt to bring about the same result.

When the teacher is satisfied that when the lips are closed there is right direction of voice, with freedom of tone, the same procedure may be followed with the tongue lifted to the n position. This accomplished, the two should be alternated, still using the strip of paper placed lightly under the nostrils to establish the sense of vibration at the edges of the nostrils. The next step is to produce the same result without the use of the paper. Similar procedure will be followed for the sound of ng.

If the sound of m is arrived at in the foregoing manner, the tongue, as has been said, will be in its normal position, ready for the indefinite vowel sound of ũ, so that by merely separating the lips, we have the syllable mũ. Applying the strip of paper again under the nostrils, let the pupil feel that there is vibration of the paper when the voice is directed through the nose for m, but that when the lips are separated, and the voice comes through the mouth, he feels no vibration. Repeat m opening into ũ until it is felt that the child really senses the difference between the voice coming through the nose, and the voice coming through the





mouth, first with the paper, and then without.

Next, with the tongue raised to the n position, let the child feel the difference between the vibration as it comes through the nose, and then through the mouth when the tongue has moved down to its normal position, back of the lower teeth, producing the syllable nũ.

After ũ, the vowel sound that will require the least tongue movement is aw, as in fall. Let the pupil see and feel that the shape of the lips changes for this sound. With the tip of the forefinger placed at one corner of the mouth, and the thumb at the opposite corner, the change in the shape of the lips will be felt as the teacher says with exaggeration first mu and then maw; nũ, and then naw. From the maw position, a further contraction of the muscles will be felt when the lips are drawn in to the oo position, as in book, and the glide from aw to oo when repeated rapidly will become ō, as in note. Alternate mō with nō. If in giving the syllables mũ, maw, mō, the voice in the vowel is not a pure tone free from nasality, go back to the strip of paper and let the child feel the vibration. Keep referring to this device for sensing voice through the nose and voice through the mouth as often as is necessary to keep the child conscious of the difference until the change from one type of voice to the other becomes automatic.

Grouped, the exercises are as follows:





Drilled across and 1 m, these make very good voice building exercises, requiring little effort in the movement of tongue and lips, so that attention may be focused on direction of tone and change from 1 to 2 tone.

	<u>2</u>	
m	mũ	maw
n	nũ	naw
ng	ngũ	ngaw

	<u>3</u>	
	maw	mō
	naw	nō

	<u>4</u>		
mũ	maw	mō	mōō (as in too)
nũ	naw	nō	nōō

With vowel initial:

	<u>1</u>		
ũm	awm	ōm	ōōm
ũn	awn	ōn	ōōn

	<u>2</u>		
mum	mawm	mom	moom
nun	nawn	non	noon

	<u>3</u>		
ũmũ	awmaw	ōmō	ōōmōō
ũnũ	awnaw	ōnō	ōōnōō

1

in	in
in	in
in	in
in	in

2

in	in	in
in	in	in
in	in	in

3

in	in
in	in

4

in	in	in
in	in	in

With vowel initial:

1

in	in	in
in	in	in

2

in	in	in
in	in	in

3

in	in	in
in	in	in



Drilled across and down, these make very good voice building exercises, requiring little effort in the movement of tongue and lips, so that attention may be focused on direction of tone and change from nasal to oral tone.

In all education we work from the known to the unknown. When teaching speech to the deaf we must keep in mind, also, that we work from the seen to the unseen. As has been described, the pupil is first taught the use of outgoing breath by means of blowing. Later the sense of this outgoing breath is objectified by means of a strip of paper held before the lips or under the nostrils. A way of inducing the speech sounds of m and n separately and in syllable form with the indefinite vowel sound of ū, and also gū and hū, has just been outlined. It is not necessary for the child to have covered all this ground, however, before introducing the most easily seen breath continuants. In fact, as soon as the child can make the transition from m to hū and n to hū, work may be begun on the combinations of ghū, khū, thū, sū and phū. It may even be that some of these syllables will be learned more readily than the mū and nū combinations; but they are not primarily voice building, and therefore, from the standpoint of the development of a free, easy, articulate voice, with more natural resonant quality than is often found in the voice of the deaf, it is time saved in the end to follow the approach suggested.

Drilled across and down, these make very good voice  
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#### IV

#### THE CONTINUANTS

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With the strip of paper held vertically before the lips, and the tips of the child's fingers touching lightly the cheek and chin of the teacher, the middle finger close to the corner of the mouth, let the pupil see the movement of the paper when the emission of breath for wh is given, and feel the vibration which occurs with the sound of ũ. With the fingers in this position, it is also possible to feel the contraction of the muscles for wh and the relaxation for ũ. The teacher should repeat this syllable a number of times, both with full face view and in profile, before the child is encouraged to try. Care will, of course, be taken to see that the child's tongue is in its normal position, with the tip of the tongue back of the lower front teeth, and filling the entire space from side to side, and thoroughly relaxed. Too much emphasis cannot be placed on this necessity.

The same procedure will be followed for fũ, and then the two will be alternated: whũ, fũ; whũ, fũ, etc. If in the beginning the wh and f are prolonged, rather than the ũ which should be very short, it will help to establish the impression of ample breath in this group of consonants. As a check on herself, the teacher should look in a mirror, and watch the movement of the lips and tongue when repeating "father" many times. If the word is said without the slightest exaggeration of lips or tongue, it will be noticed that for f the lower lip approximates the upper teeth on the top of the lip, not inside of the lip, nor is the lip drawn inside of the teeth. It will



With the strip of paper held vertically before the lips, and the tips of the child's fingers touching lightly the cheek and chin of the teacher, the middle finger close to the corner of the mouth, let the pupil see the movement of the paper when the emission of breath for wh is given, and feel the vibration which occurs with the sound of h. With the fingers in this position, it is also possible to feel the contraction of the muscles for wh and the relaxation for h. The teacher should repeat this syllable a number of times, both with full face view and in profile, before the child is encouraged to try. Care will, of course, be taken to see that the child's tongue is in its normal position, with the tip of the tongue back of the lower front teeth, and filling the entire space from side to side, and thoroughly relaxed. Too much emphasis cannot be placed on this necessity.

The same procedure will be followed for fh, and then the two will be alternated: whh, fh; whh, fh, etc. If in the beginning the wh and fh are prolonged, rather than the h which should be very short, it will help to establish the impression of ample breath in this group of consonants. As a check on herself, the teacher should look in a mirror, and watch the movement of the lips and tongue when repeating "father" many times. If the word is said without the slightest exaggeration of lips or tongue, it will be noticed that for f the lower lip approximates the upper teeth on the top of the lip, not inside of the lip, nor is the lip drawn inside of the teeth. It will



be noticed, too, that the tip of the tongue when giving th does not protrude between the teeth. This is the model that must be set before the child. In the anxiety to help objectify the movement as much as possible, the tendency is to use exaggerated movement. This must be guarded against in the interest of natural speech. Concentrating the child's attention on the movement of the paper will tend to relieve constriction and produce a free tone. If, in the first attempts, the lip is held too tightly against the upper teeth in giving f, or if for any other reason there is not breath enough, tear bits of paper, place them in the palm of the hand, and encourage the child to blow them off with lip in position for f. This quickly releases the lip, and shows the amount of breath necessary for good speech.

As soon as a new syllable is learned, it should be contrasted with those already learned. When introducing the sound of s, there will be no need to call attention to the position of the tongue if the pupil is taught to blow against the edge of the slip of paper, instead of the flat surface, as for the other breath elements. The less attention called to the position of the tongue at any time, the better; but the teacher must keep constant watch to see that all the contacts of the tongue are made at the right place, and that the position and relaxation of the tongue are correct for the elements being produced. The paper should be held very lightly between the thumb and forefinger for the sound of s in order to vibrate



be noticed, too, that the tip of the tongue when giving the sound of g, does not protrude between the teeth. This is the model that must be set before the child. In the anxiety to help objectively the movement as much as possible, the tendency is to use exaggerated movement. This must be guarded against in the interest of natural speech. Concentrating the child's attention on the movement of the paper will tend to relieve constriction and produce a free tone. If, in the first attempt, the lip is held too tightly against the upper teeth in giving the sound of g, or if for any other reason there is not breath enough, fear of paper, place them in the palm of the hand, and encourage the child to blow them off with lip in position for g. This quickly releases the lip, and shows the amount of breath necessary for good speech.

As soon as a new syllable is learned, it should be contrasted with those already learned. When introducing the sound of g, there will be no need to call attention to the position of the tongue if the pupil is taught to blow against the edge of the slip of paper, instead of the flat surface, as for the other breath elements. The less attention called to the position of the tongue at any time, the better; but the teacher must keep constant watch to see that all the contacts of the tongue are made at the right place, and that the position and relaxation of the tongue are correct for the elements being produced. The paper should be held very lightly between the thumb and forefinger for the sound of g in order to vibrate



the paper enough to be seen and felt.

To objectify the breath content for sh, the strip of paper should be turned back to the flat surface. For this element the teacher will draw attention to the slightly drawn-in corners of the mouth, and the slight forward movement of the lips which gives them a somewhat square appearance. She may even shape the child's lips for him. Contrasting shǔ with sǔ through the sense of touch as well as sight will be helpful in teaching this element.

It will be noted that all of the continuants are presented in combination with ǔ, so that thus far we have syllables as follows:

mǔ, nǔ, whǔ, fǔ, thǔ, sǔ, shǔ

The order of the elements in the syllable may then be reversed giving:

ǔm, ǔn, ǔf, ǔth, ǔs, ǔsh

We are now prepared for three elements in our syllable. The m and n that have already been learned as finals may be used, and a drill like the following may be presented.

fum thum sum shum

fun thun sun shun

Reversed, we have

muf muth mus mush

nuf nuth nus nush

The indefinite vowel sound of ǔ has been used up to this time to establish the habit of the tongue held softly in

the paper enough to be seen and felt.

To objectify the breath content for an, the strip of paper should be turned back to the flat surface. For this element the teacher will draw attention to the slightly drawn-in corners of the mouth, and the slight forward movement of the lips which gives them a somewhat square appearance. She may even shape the child's lips for him. Contrasting an with an through the sense of touch as well as sight will be helpful in teaching this element.

It will be noted that all of the consonants are presented in combination with a, so that thus far we have syllables as follows:

mā, nā, wā, fā, tū, sū, an

The order of the elements in the syllable may then

be reversed giving:

am, ān, ūf, ūt, ūs, ūsh

We are now prepared for three elements in our syllable. The m and n that have already been learned as finals may be used, and a drill like the following may be presented.

am am am am am

am am am am am

Reversed, we have

ma na wa wa wa

na wa wa wa wa

The indefinite vowel sound of i has been used up to this time to establish the habit of the tongue held softly in



its normal position in the mouth, allowing concentration on the consonant elements.

These continuants may now be combined with aw, ō and ōō:

faw	thaw	saw	shaw
fō	thō	sō	shō (show)
fōō	thōō	sōō	shōō (shoe)

awf	awth	aws	awsh
ōf	ōth	ōs	ōsh
ōof	ōoth	ōos	ōosh

They may also be contrasted with m and n:

maw	naw	faw	awm	awn	awf
mō	nō	fō	ōm	ōn	ōf
mōō	nōō	fōō	ōom	ōon	ōof

maw naw thaw, etc.

Drills should be done down and across.

Since the short vowels occur in so many of our words, it is well to introduce them as early as possible in building speech for the deaf. Because they are of shorter duration, they do not make the demand on the vocal cords that the long vowels do, and the tongue position is more relaxed. It is not necessary to try to develop them all at once. Starting with ū and ō, go on to the ī, ē and ā as the child is able to take them. Much can be done with the ū and ō.

its normal position in the mouth, allowing concentration on the consonant elements.

These combinations may now be combined with aw, o and

oo:

law	thaw	saw	shaw
fo	tho	so	sho (show)
loo	thoo	soo	shoo (shoe)

aw	awth	awa	awaw
of	ofth	os	osh
oo	ooth	ooa	ooash

They may also be contrasted with m and n:

maw	naw	law	am	an	aw
mo	no	fo	om	on	of
mo	no	loo	oom	oon	oo

maw law thaw, etc.

Drills should be done down and across.

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It has been found that the short vowels are best taught in combination with a final consonant sound:

Example:

ũf      ũth      ũs      ũsh

õf      õth      õs      õsh

ĩf      ĩth      ĩs      ĩsh

ěf      ěth      ěs      ěsh

ǎf      ǎth      ǎs      ǎsh

Prolonging the initial consonant, the following can be developed gradually:

fũ      thũ      sũ      shũ

fõ      thõ      sõ      shõ

fĩ      thĩ      sĩ      shĩ

fě      thě      sě      shě

fǎ      thǎ      sǎ      shǎ

Inasmuch as we do not carry on conversation in disjointed syllables, as early as it is felt expedient work must be started on combining them, first by repetition of the same consonant, and then changing and alternating the consonant. For this purpose, too, the short vowels will be best, though the long vowels need not be neglected. Each line in the following drill must be done with one breath, being sure to keep the force of the breath equal for each consonant sound in much the same way as outlined for corrective work (see p. 17); except that it will not be necessary in most cases to prolong the sound as long as when used to correct faults.

It has been found that the short vowels are best

taught in combination with a final consonant sound:

Example:

ū	ūh	ūa	ūab
ō	ōh	ōa	ōab
ī	īh	īa	īab
ē	ēh	ēa	ēab
ē	ēh	ēa	ēab

Prolonging the initial consonant, the following

can be developed gradually:

f	fū	fūh	fūa
t	tū	tūh	tūa
l	lū	lūh	lūa
s	sū	sūh	sūa
a	aū	aūh	aūa

Inasmuch as we do not carry on conversation in dis-

jointed syllables, as early as it is felt expedient work must be started on combining them, first by repetition of the same consonant, and then changing and alternating the consonant.

For this purpose, too, the short vowels will be best, though

the long vowels need not be neglected. Each line in the following drill must be done with one breath, being sure to keep the force of the breath equal for each consonant sound in which the same way as outlined for corrective work (see p. IV); except that it will not be necessary in most cases to prolong the sound as long as when used to correct faults.



fũ

fuf

fufu

fufuf

fufufu

fufufuf, etc.

As the child gains proficiency in sustaining the breath, he can go faster and faster; but the amount of breath in each consonant must be kept constant. The tendency will be to lose the breath content after the first repetition or two of the consonant. This must be guarded against. A game may be made to see how many syllables can be given on one breath, the teacher keeping count by a short mark on the board or paper for each syllable. The child will bend every effort to increase the number of marks. Other consonants should then be substituted for the f.

When the child is able to repeat these syllables after the teacher satisfactorily, the written form may be introduced. The syllables should be written on the board, not always in the same order. The procedure will be for the teacher to pronounce the syllable, the child repeat it, and then point to the printed form. The steps are completed when the child is able not only to take the syllable from the teacher's lips, repeat it and point to the written form, but also to write it himself. This lays a good foundation for lip-reading as well as reinforcing his memory of the spoken form.

12

101

102

103

104

105, etc.

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## V

## THE STOP CONSONANTS

That group of consonants variously called stops, explosives, or plosives, must be given very careful attention in the teaching of speech to the deaf. While it is common practice to start the approach to these sounds with the breath group, p, t, k, approach by means of the vocalized group, b, d, g, will repay the greater effort it requires. It is usually easier to induce the breath content, once the voice has been learned, than to get the voiced element after the breath has been associated with the same position of the lips or tongue. The order, therefore, will be b, d, g, practiced in syllable form; e.g., ūbububububu, etc., ūdududududu, etc., ūgugugugugu, etc. It will be noticed that the lip and tongue positions for these elements parallel those for m, n and ng, so that if the contacts have been made for the latter, the way has been prepared for an easier understanding of what will be required for the b, d, g. The important thing will be to establish the difference in the application of voice from the continuant directed through the nose, m, n, ng, to the stop with voice directed through the mouth, b, d, g.

Reverting to our strip of paper, let the child feel the vibration by holding the paper under the nostrils of the

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Reverting to our strip of paper, let the child feel the vibration by holding the paper under the nostrils of the



teacher when she says mumumu; then attract his attention to the fact that he feels no vibration when she says ubububububu. He will feel the contact similarly when she says, nunununu, udududududu; and again in ngungungungu, ugugugugu. When this difference of vibration or absence of it has been thoroughly sensed, the child will place his own strip of paper under his nostrils and try to imitate what he has felt. Again he will feel while the teacher demonstrates, and then try to get the same results from himself. The alternating process of teacher and pupil will be continued until the desired result has been obtained. There will be two values in using the strip of paper in this way. In the first place, it will help to establish the habit of the child waiting until the teacher has finished the demonstration before he makes his attempt; and in the second place, it will help to focus the attention on the outgoing voice through the nose for the m, n and ng, and through the mouth for the b, d and g. When the direction of tone has been started in this way, the child may be allowed to feel the difference in vibration by placing the fingers on the cheeks close to the lips, so that he may feel not only the vibration in the cheek but also the movement of the muscles about the lips. When, after due practice, the teacher feels that the right voice quality is in these sounds, ububububu may be changed to unbun - a bun; ubawbawbaw to unbawl - a ball; ududududu, udol - a doll; ugugugu, ugun - a gun, and gum.

If a moving picture of the production of these stop



teacher when she says mmmmm; then attract his attention to  
 the fact that he feels no vibration when she says uuuuuuuuu.  
 He will feel the contact similarly when she says, nnnnnnnnn.  
 uuuuuuuuu; and again in ngngngngng, ngngngng. When this  
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 lips. When, after due practice, the teacher feels that the  
 right voice quality is in these sounds, uuuuuuu may be  
 changed to uhuu - a hum; uuuuuuuuu to uhuu - a bell;  
 uuuuuuu, uhuu - a bell; uuuuuuu, uhuu - a hum, and gnn.  
 If a moving picture of the production of these stop



consonants were taken and then slowed down when reproduced, it would be seen that there is a slight pause before these elements are exploded which holds back the voice or breath for an instant before it is released. In ordinary conversation this pause is so slight that it is not noticeable; but it is very important in teaching speech to the deaf to make sure that this pause takes place; otherwise the amount of voice or breath expelled in giving these sounds will not be enough to make for intelligible speech.

To help establish the amount of breath necessary in p, hold the strip of paper before the closed lips, and let the child see its movement when the breath that has accumulated is released by the opening of the lips, and at the same time, with one hand placed at the diaphragm, let him feel the intake of breath, and that it is held an instant before being released. The focusing of the attention of the child at the diaphragm and on the strip of paper which he is going to blow will prevent constriction of the muscles of the throat and tongue. The teacher will give the pattern many times before expecting the child to try. She will also be sure that, while there is precision of contact, there is no tension of the muscles in any way.

The procedure for t will be the same, attention this time being called to the position of the tongue raised to the n position, and held for an instant, as in p, before allowing the release of the breath. It will be noticed that only the



consonants were taken and then allowed down when reproduced, it would be seen that there is a slight pause before these elements are exploded which holds back the voice or breath for an instant before it is released. In ordinary conversation this pause is so slight that it is not noticeable; but it is very important in teaching speech to the deaf to make sure that this pause takes place; otherwise the amount of voice or breath expelled in giving these sounds will not be enough to make for intelligible speech.

To help establish the amount of breath necessary in g, hold the strip of paper before the closed lips, and let the child see its movement when the breath that has accumulated is released by the opening of the lips, and at the same time, with one hand placed at the diaphragm, let him feel the intake of breath, and that it is held an instant before being released. The focusing of the attention of the child at the diaphragm and on the strip of paper which he is going to blow will prevent contraction of the muscles of the throat and tongue. The teacher will give the pattern many times before expecting the child to try. She will also be sure that, while there is precision of contact, there is no tension of the muscles in any way.

The procedure for f will be the same, attention this time being called to the position of the tongue raised to the n position, and held for an instant, as in g, before allowing the release of the breath. It will be noticed that only the



part of the tongue which is between the two incisors leaves the t position; that the whole tongue does not drop away, and that if the breath is directed toward the strip of paper, the result will be just the sound of t, and not t followed by a breathed u. This is the only t that will combine with a vowel without an aspirate intervening between it and the vowel.

In forming k care should be taken that here, again, the direction of breath is out; that there is no pulling down of the back of the tongue, but just a releasing of the breath. The back of the tongue must be spread to fill the entire space from side to side, the breath being released over the center of the tongue only. The effort to blow the paper with pressure from the diaphragm after the breath has been held for a second when the tongue is raised to the same position, as for ng, will produce the breath sound of k.

For practice, these elements may be put into a drill as follows:

1

m      p      b

n      t      d

ng      k      g

They should be done slowly at first, giving plenty of time for the holding of the breath before its release as either breath or voice or voice through the nose, and the tempo gradually increased, never sacrificing accuracy to speed, until they are

part of the tongue which is between the two incisors leaves the i position; that the whole tongue does not drop away, and that if the breath is directed toward the strip of paper, the result will be just the sound of i, and not i followed by a breathed y. This is the only i that will combine with a vowel without an aspirate intervening between it and the vowel.

In forming i care should be taken that here, again, the direction of breath is out; that there is no pulling down of the back of the tongue, but just a releasing of the breath. The back of the tongue must be spread to fill the entire space from side to side, the breath being released over the center of the tongue only. The effort to blow the paper with pressure from the diaphragm after the breath has been held for a second when the tongue is raised to the same position, as for ng, will produce the breath sound of i.

For practice, these elements may be put into a drill as follows:

<u>i</u>		
m	u	p
n	t	d
ng	k	g

They should be done slowly at first, giving plenty of time for the holding of the breath before its release as either breath or voice or voice through the nose, and the tempo gradually increased, never sacrificing accuracy to speed, until they are



of normal duration. It is not necessary, however, to wait until normal speed is acquired before combining these elements with vowels. In fact, as soon as the child has the idea, and a degree of ability to produce them with right direction of breath has been attained, they should be combined as follows, at first holding the consonant position, but making the voice in u very short, gradually increasing tempo until the consonant is of normal duration. Drill both down and across.

<u>2</u>			<u>3</u>			<u>4</u>		
mǔ	pǔ	bǔ	ǔm	ǔp	ǔb	ǔmǔ	ǔpǔ	ǔbǔ
nǔ	tǔ	dǔ	ǔn	ǔt	ǔd	ǔnǔ	ǔtǔ	ǔdǔ
ngǔ	kǔ	gǔ	ǔng	ǔk	ǔg	ǔngǔ	ǔkǔ	ǔgǔ

Other short or long vowels should be introduced as ability permits or need requires. In drill 4, accent sometimes the initial vowel, and sometimes the final vowel. Later, ch and i may be added to the explosive groups, and made a part of the drill. The learning of ch is facilitated if it is introduced first as a top shut position.

These drills make a very good basis for building words, and for emphasizing the difference in the application of breath and voice in these groups of elements that look alike in lip reading, but which are not articulated the same. The single element drill (1) can always be used for quick drill to keep the child conscious

of normal duration. It is not necessary, however, to wait until normal speed is acquired before combining these elements with vowels. In fact, as soon as the child has the idea, and a degree of ability to produce them with right direction of breath has been attained, they should be combined as follows, at first holding the consonant position, but making the voice in a very short, gradually increasing tempo until the consonant is of normal duration. Drill both down and across.

<u>2</u>			<u>3</u>			<u>4</u>		
m	p	m	m	p	m	m	p	m
n	t	n	n	t	n	n	t	n
ng	k	ng	ng	k	ng	ng	k	ng

Other short or long vowels should be introduced as ability permits or need requires. In drill 4, accent sometimes the initial vowel, and sometimes the final vowel. Later, ph and f may be added to the explosive groups, and made a part of the drill. The learning of ch is facilitated if it is introduced first as a top short position.

These drills make a very good basis for building words, and for emphasizing the difference in the application of breath and voice in these groups of elements that look alike in lip reading, but which are not articulated the same. The single element drill (1) can always be used for quick drill to keep the child conscious



of these differences, and the combinations with the indefinite voice (2, 3 and 4) can always be referred to when making combinations with other vowel sounds that may be difficult.

The same elements, grouped in this way, may also be used to teach single final consonant sounds and double consonant combinations both initial and final. In the single breath finals the position is held an instant before being released. In the single voiced finals the voice is stopped by holding the position, and neither breath nor voice allowed to escape when the position is released. In the final double and triple consonant combinations, if the first consonant in the group is a stop consonant, it should be held before adding the next sound or sounds. If the first consonant in the combination is a fricative, that element should be prolonged, and the others added.

### 1

ũm    ũp    ũb

ũn    ũt    ũd

ũng    ũk    ũg

### 2

ũms    ũps    ũbs

ũns    ũts    ũds

ũngs    ũks    ũgs

### 3

ũsps

ũsts

ũsk

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1			2		
ūa	ūp	ūb	ūpa	ūpb	ūba
ūu	ūt	ūb	ūta	ūtb	ūba
ūng	ūk	ūg	ūna	ūngb	ūnga
3			4		
			ūpa	ūpb	ūba
			ūta	ūtb	ūba
			ūna	ūngb	ūnga



	<u>4</u>				<u>5</u>		
mǔ	pǔ plǔ	bǔ blǔ		mǔ	pǔ plǔ prǔ	bǔ blǔ brǔ	
nǔ	tǔ	đǔ		nǔ	tǔ trǔ	đǔ drǔ	
ngǔ	kǔ klǔ	gǔ glǔ		ngǔ	kǔ klǔ krǔ	gǔ glǔ grǔ	

	<u>6</u>				<u>7</u>		
sm	sp	b		smǔ	spǔ	bǔ	
sn	st	d		snǔ	stǔ	đǔ	
ng	sk	g		ngǔ	skǔ	gǔ	

If the principle of what may be termed "the hold" has been well taught in the single element drill, the problem of double consonants is practically eliminated, and it is understood that in the above drills this principle will be followed. The speed should be quickened gradually until it comes to a normal speed of articulation. In building words with different vowel sounds, reference should be made continually to the basic drill of m, p, b, etc.; ǔm, ǔp, ǔb, etc.; mǔ, pǔ, bǔ, etc., given above.

1. Avery, Dorsey and Siskela. First Principles of Speech Training. New York: D. Appleton and Company, 1928, p. 100.

<u>4</u>			<u>5</u>		
m̃	p̃	m̃	p̃	m̃	m̃
p̃	p̃	p̃	p̃	p̃	p̃
m̃	m̃	m̃	m̃	m̃	m̃
m̃	m̃	m̃	m̃	m̃	m̃
m̃	m̃	m̃	m̃	m̃	m̃

<u>4</u>			<u>5</u>		
m̃	p̃	m̃	p̃	m̃	m̃
p̃	p̃	p̃	p̃	p̃	p̃
m̃	m̃	m̃	m̃	m̃	m̃
m̃	m̃	m̃	m̃	m̃	m̃
m̃	m̃	m̃	m̃	m̃	m̃

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ally to the basic drill of m. p. b. etc.; m̃. p̃. b̃. etc.;

m̃. p̃. b̃. etc., given above.



## VI

### THE VOWEL

Consonants may be likened to the framework of speech. They give form and definiteness, and, as has been said, are important for understandable speech, but, except for the m, n, ng, l and r which have a vowel quality, they have no beauty. It is the vowel that gives beauty, variety and interest to speech. Here we have the resonance that makes, or mars, a voice; too, it is only the vowel that can give inflection to the voice, and accent and rhythm to speech.

Within the small compass of the mouth, there is the possibility of an infinite variety of sounds. It used to be thought that vowel changes took place entirely in the oral cavity; that is, that the position of the tongue in the mouth, aided by the movement of the lips, determined the vowel sound. Recent examination by means of the laryngo-periskop and X-ray photographs show

that for every vowel other changes occur — in the size and shape of the pharyngeal cavity and in the adjustment of the vocal cords, and that these changes are probably of even greater importance than those relating to the mouth cavity.<sup>1</sup>

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1 Avery, Dorsey and Sickels, First Principles of Speech Training, New York, D. Appleton and Company, 1928, p. 106.

## VI

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that for every vowel other changes occur — in the size and shape of the pharyngeal cavity and in the adjustment of the vocal cords, and that these changes are probably of even greater importance than those relating to the mouth cavity.

I. Avery, Dorsey and Siskela, First Principles of Speech Training, New York, D. Appleton and Company, 1928, p. 108.



It has always been recognized that the consonant position must be exact and without deviation, but that the vowel position may vary within certain limits and still be recognized for the one intended.<sup>1</sup> Recent X-ray photography substantiates this view, at the same time seeming to reveal facts in regard to the formation of vowels which were hitherto obscure, and showing that, outside of that limit, the slightest change in position or tension of the vocal organs will produce a different result.<sup>2</sup> In other words, the same sound may result even though the tongue should vary slightly in its high or low, front or back position. It will also vary according to the individual, and even the same individual may not have the same tongue position for the same vowel at all times. However, a certain amount of adjustment of jaw, lips and tongue automatically brings about the proper adjustment of the larynx and pharynx, so that teachers of speech do not, as yet, attempt to teach these vowel movements in any other way than by the changes in the buccal cavity.

The vowel sounds are divided into three classes, front, back and middle. The front and back positions of the tongue may move from a high to a low position; the middle of the tongue rises slightly and descends to normal position. In all vowel sounds the tip of the tongue should be back of

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1 A. J. Story, "The Importance of the Consonants in Speech," Association Review, Washington, D.C., Volta Bureau, Vol. XI, 1909, pp. 479-488.

2 G. Oscar Russell, Speech and Voice, New York, Macmillan Company, 1931.



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the lower teeth, closely approximating them, and the lower the tongue can be kept, consistent with the correct sound of the vowel, the better will be the tonal quality, inasmuch as the mouth is a resonating chamber, and the larger the cavity, the more vibrating space there will be.

Position of the tongue for a given vowel is important; but it is the attack of the vowel that determines its clarity. In the section on the larynx it was stated that it is the nice approximation of the vocal cords that the teacher of speech to the deaf must strive for in order to obtain a good quality of voice. The clear fundamental tone necessary for normal speech is dependent on attack. No matter how correct the formation of the element, speech will be normal only in the degree to which this clear fundamental tone is attained. Correct articulation cannot compensate for lack of tonal quality.

Another equally important element in the clearness of the vowel is the direction of tone. Granted that the tongue takes on the right position, and the attack is properly made, if the tone is not directed to the lips as the focal point, except in m, n and ng, when the focal point, as has been pointed out, should be the outer edges of the nostrils, it will drop back into the throat and be reflected against the oral-pharynx, giving a throaty or muffled quality to the voice. The failure to keep in mind direction of tone has been one of the reasons for the unpleasant voices of many of



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the mouth is a resonating chamber, and the larger the cavity,  
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Position of the tongue for a given vowel is im-  
portant; but it is the attack of the vowel that determines  
its clarity. In the section on the larynx it was stated that  
it is the nice approximation of the vocal cords that the  
teacher of speech to the deaf must strive for in order to  
obtain a good quality of voice. The clear fundamental tone  
necessary for normal speech is dependent on attack. No matter  
how correct the formation of the element, speech will be  
normal only in the degree to which this clear fundamental  
tone is attained. Correct articulation cannot compensate for  
lack of tonal quality.

Another equally important element in the clearness  
of the vowel is the direction of tone. Granted that the tongue  
takes on the right position, and the attack is properly made,  
if the tone is not directed to the lips as the focal point,  
except in m, n and ng, when the focal point, as has been  
pointed out, should be the outer edges of the nostrils, it  
will drop back into the throat and be reflected against the  
oral-pharynx, giving a throaty or whiffled quality to the  
voice. The failure to keep in mind direction of tone has  
been one of the reasons for the unpleasant voices of many of



our deaf. The ear helps in the direction of tone with hearing people, as evidenced by the fact that when people begin to lose their hearing, the voice often loses the outward direction, and takes on a muted quality. The deaf do not have the ear to guide them, and must depend upon the kinesthetic sense. Consonants help in carrying the voice forward; but the vowel, too, must be well focused. If the idea that speech is in the mouth is held before the pupil, it will help toward this end.

The principle of "the hold" which already has been described in relation to the stop consonants, can easily be applied to the vowel in order to give the definite fundamental tone desired. If, when the edges of the vocal cords are approximated gently, the breath is held for an instant before being released, the vowel will be wholly vocalized, and the aspirate sound that so often precedes an initial vowel if the vocal cords are not approximated with sufficient firmness will be prevented.

Vowels are best taught in combination with a consonant, and since m or f require the least effort to produce and both aid in the forward direction of the voice, they are good for this purpose. It has been established that the short vowels are best taught with a final consonant, the long vowels with an initial consonant. When the syllable begins with a vowel, the tongue and lips should take the position of the vowel. The vowel position is kept while the breath is held by the diaphragm, and at a signal from the teacher the voice



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is released. The thumb and forefinger held together may represent the held position, and when the instructor feels that the position has been held long enough to bring relaxation, she separates the finger and thumb to indicate the release of the voice, and closes them immediately to indicate that the voice is of short duration, and should be stopped.

After the difference between voice through the nose, as in m, n and ng, and voice through the mouth, as in -u-, has been established, subsequent vowel sounds may be presented in combination with f, s, sh; and when satisfactory may be added to the list of vowels already learned. There should be daily practice, for a few minutes, of the vowel sounds in the manner just described for attack. The list when completed will be as follows:

### VOWEL SOUNDS\*

#### long vowels

o-e	(oa, ow, -o)	ō
i-e	(igh, -y)	ī
aw	(au, o[r], all)	ô
ee	(ea, e-e, -e)	ē
oo	([r]u-e, [r]ew	ōō
ar		ā

\*Spelling as given in Formation and Development of Elementary English Sounds by Dr. Caroline A. Yale, Northampton, Mass., Gazette Printing Company, 1914.

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\*  
VOWEL SOUNDS  
Long vowels

ō	(or, ow, -o)	o-e
ī	(igh, -y)	i-e
ā	(an, o[r], all)	a
ē	(ee, e-e, -e)	ee
ōō	([r]u-e, [r]ew	oo
ē		et

\*Spelling as given in Formation and Development of Elementary English Sounds by Dr. Caroline A. Yale, Northampton, Mass., Gamette Printing Company, 1914.



long vowels (cont.)

ou (ow)

oi (oy)

a-e (ai, ay)

ā

ur (er, ir)

û

u-e (ew)

ū

short vowels

-u-

ũ

-o-

ō

-i- (-y)

ĩ

-e- (ea)

ē

-a-

ā

oo (book)

ōō

If, when doing this exercise, the breath is held by means of the diaphragm before phonation, and the movement of the muscles and vibration of the voice felt at the lips, there will be no forcing of the voice from the larynx. Under no circumstances should attention be called to the vibration in the larynx by placing the hand at the throat, if a well-directed tone, free from constriction is desired, for the voice tends to follow the direction of thought. Since direction of the voice should be to the lips, any suggestion that will help in the accomplishment of this aim may be used. The teacher should watch for the first sign of constriction of the tongue and muscles of the larynx, and correct it by directing

# Long vowels (cont.)

ou	(ow)
oi	(oy)
e-e	(ai, ay)
u-u	(au, ay)
u-o	(ow)

# Short vowels

u	-u-
o	-o-
i	-i- (y)
e	-e- (ae)
a	-a-
oo	oo (book)

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attention from the diaphragm to the lips.

As soon as the pupil has given an element that can be approved by the teacher, he should be held responsible for its recall. The teacher must not yield to the temptation of allowing herself to be a crutch for the child. He must be taught from the beginning to depend upon his own thinking powers and upon his kinesthetic sense, inasmuch as a memory for speech formation must be firmly established.

The teacher for her part must train herself to listen critically, and should learn to depend upon her ear, rather than her eyes, for the correct voice quality and articulation. She should listen to her own voice and pronunciation, and compare it with others in order to help herself to become discriminating in regard to speech sounds. If she has never taken any work in voice and speech improvement for herself, she should do so. She will then have a standard for purposes of comparison.

Besides the short daily drill of the long and short vowels, there must be drill in combination with the consonant sounds, initial and final. For example, reading down and across:

aw	baw	awb	bawb
ō	bō	ōb	bōb
ī	bī	īb	bīb
ē	bē	ēb	bēb
ā	bā	āb	barb, etc.

attention from the diagram to the lips.

As soon as the pupil has given an element that can be approved by the teacher, he should be held responsible for its recall. The teacher must not yield to the temptation of allowing herself to be a crutch for the child. He must be taught from the beginning to depend upon his own thinking powers and upon his kinesthetic sense, inasmuch as a memory for speech formation must be firmly established.

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aw	baw	awp	bawp
ō	bō	ōp	bōp
ī	bī	īp	bīp
ē	bē	ēp	bēp
ē	bē	ēp	bēp, etc.



See also examples on pages 33, 34, 41 and 42.

It would not be possible to use all vowels in all the combinations as suggested above at one time; but the basic vowels, ō, aw, ōō, ēē, or ŭ, ō, ī, can be used for general drill, with one or two others added as needed.

All words as they are learned should be classified according to their vowel sound. Emphasizing the vowel by means of classification may be carried through all grades and drilled on in the special speech period, or as a five minute drill at the beginning of the lesson in which the words occur. Words of more than one syllable should be classified according to the vowel sound in the accented syllable. This makes the pupil vowel conscious. Improvement of consonant sounds will be emphasized when drilling. By way of illustration take the lines,

Oh, look at the moon  
She is shining up there,  
Oh, mother, she looks  
Like a lamp in the air.

Last week she was smaller  
And shaped like a bow;  
But now she's grown bigger  
And round, like an O.

The classification would be as follows:

<u>ō</u>	<u>ōō</u>	<u>ă</u>	<u>ŭ</u>	<u>ōō</u>
oh	look	at	the	moon
bow		lamp	up	
grown		last	mother	
		and		
		an		

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And round, like an O.

The classification would be as follows:

<u>ō</u>	<u>ū</u>	<u>ē</u>	<u>oo</u>	<u>ō</u>
Oh	the	at	look	Oh
bow	up	lamp		bow
grown	mother	last		
		and		
		an		



<u>e</u>	<u>i</u>	<u>i</u>	<u>ē</u>	<u>aw</u>
she	is	shining	there	
week	bigger	like	air	smaller
she's				
<u>o</u>				
was				

Repetition of the same vowel in a column of words tends to bring the accent on the vowel, and this is necessary for articulate speech; therefore the words may be drilled in columns first, in order to induce the accent and flexibility of articulation which repetition of the vowel brings; and when the words can be articulated readily, the teacher may point to the words in the order in which they occur in the poem before presenting the printed form of the poem itself.

The classifying will be done at the board the first year or two under the direction of the teacher, the child deciding in which vowel column the word belongs. When the child has learned to write, he should be taught to do his own classifying, the teacher helping in irregular classifications. Later when he has learned to use the dictionary, he will be made responsible for the entire procedure. If there is enough board room to permit, the entire primary spelling vowel chart can be kept on the board in permanent form, and the new words filled in as they occur.

If no hearing aid is used, change of pitch can often be induced by use of the piano. With the tips of the

<u>sw</u>	<u>o</u>	<u>i</u>	<u>i</u>	<u>e</u>
smaller	there air	spinning like	is bigger	she week she's
				<u>o</u>
				was

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fingers resting lightly on the instrument, the child will feel the difference in vibration between the high, low and middle tones and will try to imitate the change of pitch. At the Convention of the American Association to Promote the Teaching of Speech to the Deaf, held at Providence in June, 1940, an instrument was demonstrated that flashed a change of light when there was a change in pitch. When this instrument is on the market, it will greatly facilitate the learning of inflections.

So we find that the vowel is important for articulate speech, that it depends mainly upon definite attack, forward direction, accent and rhythm for its clearness, and that inflection is desirable, though more difficult to acquire.

is that of the hearing. Truly there is no question as to the importance of breath control in speech, for as Waretzky stated breath is the "foundation of speech." However, if the directions given in the sections on "Exercises for Breath control" and the exercises given under "Classification of Elements" are followed, which teach the control of breath in conjunction with phonation, many of the difficulties we find in the use of breath in speech will be eliminated. At the same time a continual watch must be kept on the tongue to see that no wrong movement creeps in unobserved.

The tongue when in repose rests easily on the floor of the oral cavity, touching the teeth all around, its upper

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So we find that the vowel is important for antio-late speech, that it depends mainly upon definite attack, forward direction, accent and rhythm for its clearness, and that inflection is desirable, though more difficult to acquire.



## VII

### THE TONGUE

Although "a little member" the tongue is the most important of the organs of articulation. On its free, flexible movement depends the intelligibility of speech. Its misuse is the cause of most of the faults with which we are confronted. A great deal has been written on the use of the breath in phonation. Studies have been made checking the movements of the diaphragm, and measuring the length of the breath as found in the artificial speech of the deaf as compared with that of the hearing. Truly there is no question as to the importance of breath control in speech, for as heretofore stated breath is the "foundation of speech." However, if the directions given in the sections on "Exercises for Breath control" and the exercises given under "Classification of Elements" are followed, which teach the control of breath in conjunction with phonation, many of the difficulties we find in the use of breath in speech will be eliminated. At the same time a continual watch must be kept on the tongue to see that no wrong movement creeps in unobserved.

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The tongue when in repose rests easily on the floor of the oral cavity, touching the teeth all around, its upper



surface slightly convex, the back in close proximity to the soft palate. Its function in speech is to mold the voice as it comes through the oral cavity so that, motivated by the speech centers of the brain, the combination of sounds necessary for the expression of ideas is produced. Being a muscle, it is subject to the same laws of exercise, control and flexibility as other muscles of the body. Although moving within a small space, due to the freedom of movement of the unattached parts it is capable of a great variety of adjustments. In consonant formation, as has been said, these adjustments must be exact. In vowel formation on the other hand, there is somewhat less demand for a definite position.

Upon the free, flexible, relaxed yet definite movement of the tongue depends the intelligibility of speech, just as upon these same conditions depend satisfactory results in using other muscles for their respective purposes. It is when these conditions are not fulfilled that the greatest faults of speech arise, the most common fault being constriction of the muscles controlling the movement of the tongue. This is a fault that must be guarded against from the very beginning of the teaching of speech to the deaf. The teacher must watch for it in herself first, especially if she is of a nervous or strenuous temperament, and it seems quite safe to say that if the teacher presents to the child a relaxed position, he will respond similarly. This must not be confused, however, with a negative attitude, for the teacher of the deaf, whether present-



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ing speech, language, or any other subject, must be positive and dynamic in order to arouse in the pupil a definite attitude toward his work. At the first sign of tenseness in herself, the teacher should stop and quietly and unobtrusively take two or three long, relaxing breaths. When the pupil shows tenseness, stroke his arm or cheek with a long easy movement, or should this not be enough to bring the desired result, have the child bend forward and swing the arms.<sup>1</sup> Then return to the problem in hand. To follow this procedure as the need arises carries over the relaxation into specific action, and is of more value than having a period set apart for relaxing exercises, as is sometimes advocated.

With the teeth separated not more than the width of a finger, except when doing corrective exercises, and then only until the point in question is established, the tongue should be held quietly in the normal position described above, as the first step in the production of tone. It is to be noted that within the area thus created the tongue will move for the formation and combination of the elements necessary for speech. The teeth at no time will be together. Even in giving the sound of l the tongue must still be broad, allowing the voice to pass through small openings at the sides. In s and sh the teeth will approximate closely, but not touch. The tongue

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never protrudes beyond the teeth in finished speech. To place the tongue on the upper lip to show the closure for n, or the contraction of the sides for l, or to protrude the tongue beyond the teeth for th would be permissible for illustrative purposes, but such abnormal positions should be only transitory, and never drilled, the tongue being brought back immediately to the normal position before adding breath or voice in these elements.

Tongue exercises with young children should not be necessary. The exercises suggested on pages 39 and 40 will give sufficient practice to exercise the tongue if carried out in the manner indicated, and if the conditions set forth in this present section are fulfilled. Tongue exercises for corrective purposes with older children may be used to advantage; but in general the less attention that is called to the tongue, the less constriction there will be. It is not advisable to open the mouth beyond its normal width for the purpose of showing a tongue position, for a position illustrated in this way will be an exaggerated one and, therefore, a wrong pattern for the young child. Even for the older child, a diagram showing the tongue position will be of more value than opening the mouth wide enough to show, for example, a back tongue position. For the most part, what can be seen with the teeth separated the width of a finger, plus what can be felt by touching the face, and using the strip of paper as suggested before, will be sufficient to bring the desired



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results.

Another important point to keep in mind is that speech for conversational purposes, as contrasted with speech for platform work, does not require much jaw movement. In ordinary conversation the tongue moves more than the jaw, and the teacher should be careful to see that the child does not substitute a jaw movement for what should be a tongue movement. For example, make sure that the tongue rises to the roof of the mouth for its contacts, rather than being placed there by the upward movement of the jaw. With the teeth separated, the tongue will have room for freedom of movement within the oral cavity. To gain flexibility of movement within this space requires a great deal of practice, but it must be a main object of the teacher of speech to the deaf.

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# Short Vowel Drills<sup>1</sup>

<u>Final</u> (consonants)					<u>Initial</u> (consonants)				
-at	-af	-if	-ef	-af	fu-	fo-	fi-	fe-	fa-
-ath	-afh	-ifh	-efh	-afh	thu-	tho-	thi-	the-	tha-
-as	-af	-is	-es	-af	sh-	so-	si-	se-	sa-
-ash	-afh	-ifh	-efh	-afh	shu-	sho-	shi-	she-	sha-

Following are syllable combinations which taken in parts may be used as drills, and in which may be found the basis for a beginning vocabulary, together with the vocabularies developed from the same. Drills should be done down to give practice in the same vowel sound with different consonant sounds, which will emphasize the vowel, and across for similar practice in emphasis of a special consonant sound.

<sup>1</sup> The spelling in these exercises is according to that known as the "Northampton Chart" which is in general use in schools for the deaf in this country. It is to be found in Formation and Development of Elementary English, published at the Clark School for the Deaf, Northampton, Massachusetts.

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Short Vowel Drills<sup>1</sup>

<u>Final</u> (continuants)					<u>Initial</u> (continuants)				
-uf	-of	-if	-ef	-af	fu-	fo-	fi-	fe-	fa-
-uth	-oth	-ith	-eth	-ath	thu-	tho-	thi-	the-	tha-
-us	-os	-is	-es	-as	su-	so-	si-	se-	sa-
-ush	-osh	-ish	-esh	-ash	shu-	sho-	shi-	she-	sha-
-um	-om	-im	-em	-am	mu-	mo-	mi-	me-	ma-
-un	-on	-in	-en	-an	nu-	no-	ni-	ne-	na-
-ul	-ol	-il	-el	-al	lu-	lo-	li-	le-	la-
<u>Stop</u> (Breath)					<u>Stop</u>				
-up	-op	-ip	-ep	-ap	pu-	po-	pi-	pe-	pa-
-ut	-ot	-it	-et	-at	tu-	to-	ti-	te-	ta-
-uk	-ok	-ik	-ek	-ak	ku-	ko-	ki-	ke-	ka-
-ub	-ob	-ib	-eb	-ab	bu-	bo-	bi-	be-	ba-
-ud	-od	-id	-ed	-ad	du-	do-	di-	de-	da-
-ug	-og	-ig	-eg	-ag	gu-	go-	--	--	ga-

1 The spelling in these exercises is according to that known as the "Northampton Chart" which is in general use in schools for the deaf in this country. It is to be found in Formation and Development of Elementary English Sounds, published at the Clark School for the Deaf, Northampton, Massachusetts.

# Short Vowel Drills

Final (consonants)					Initial (consonants)				
-uf	-ot	-il	-el	-af	fu-	fo-	fi-	fe-	fa-
-uth	-oth	-ich	-eth	-ash	thu-	tho-	thi-	the-	tha-
-us	-os	-is	-es	-as	su-	so-	si-	se-	sa-
-ush	-osh	-ish	-esh	-ash	shu-	sho-	shi-	she-	sha-
-um	-om	-im	-em	-am	mu-	mo-	mi-	me-	ma-
-un	-on	-in	-en	-an	nu-	no-	ni-	ne-	na-
-ul	-ol	-il	-el	-al	lu-	lo-	li-	le-	la-
Stop (Speech)					Stop				
-up	-op	-ip	-ep	-ap	pu-	po-	pi-	pe-	pa-
-ut	-ot	-it	-et	-at	tu-	to-	ti-	te-	ta-
-uk	-ok	-ik	-ek	-ak	ku-	ko-	ki-	ke-	ka-
-ub	-ob	-ib	-eb	-ab	bu-	bo-	bi-	be-	ba-
-ud	-od	-id	-ed	-ad	bu-	bo-	bi-	be-	ba-
-ug	-og	-ig	-eg	-ag	gu-	go-	--	--	ga-

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ng Drill

fung	fong	fing	feng	fang
thung	thong	thing	theng	thang
sung	song	sing	seng	sang
shung	shong	shing	sheng	shang
mung	mong	ming	meng	mang
nung	nong	ning	neng	nang
pung	pong	ping	peng	pang
tung	tong	ting	teng	tang
kung	kong	king	keng	kang
wung	wong	wing	weng	wang
lung	long	ling	leng	lang
hung	hong	hing	heng	hang

Vocabulary from above<sup>1</sup>

tongue	thing	long
thang (thank you)	sing	hung
finger	sang	hang
	wing	

<sup>1</sup> This vocabulary seems short due to the fact that not many words in ng would be likely to come in the first two years.





Vocabulary possible of development  
from the foregoing short vowel  
drills and usable in beginning  
speech and language development

<u>-u-</u>	<u>-o-</u>	<u>-i-</u>	<u>-e-</u>	<u>-a-</u>
thumb	moth	lip	bed	cap
fun	doll	it	egg	cat
sun	top	in	men	hat
sung	hot	pin	let	pan
bun	on	fish	hen	can
gum	dog	him	pen	man
gun	gone	big	pencil	lamb
come	got	pig	fell	hand
us	robin	ill	ten	bag
up	soft	did		sad
cup	hopped			bad
cut	not			hash
mother				ham
one				lap
hug				Dad
bug				have
tub				has
love				had
a				rabbit
the				ran

Vocabulary possible of development  
from the foregoing short vowel  
drills and usable in beginning  
speech and language development

-a-	-e-	-i-	-o-	-u-
gap	bed	lip	moth	thumb
cat	egg	it	doll	fan
hat	men	in	top	sun
pan	let	pin	hot	swag
can	hen	flash	on	ban
man	pen	him	dog	gun
lamp	pencil	big	gone	gun
hand	fell	big	got	come
bag	tea	ill	robin	us
bad		old	soft	up
bad			hopped	cup
hash			not	cut
ham				mother
lap				one
bad				ing
have				bug
has				trip
had				love
rabbit				a
ran				the



## Long Vowel Drills

Initial  
(Continuants)

fo-e	fi-e	faw	foo	fee	fow	fa-e	fur	far
tho-e	thi-e	thaw	---	thee	thow	tha-e	thur	thar
so-e	si-e	saw	soo	see	sow	sa-e	sur	sar
sho-e	shi-e	shaw	shoo	shee	show	sha-e	shur	shar
ho-e	hi-e	haw	hoo	hee	how	ha-e	hur	har
mo-e	mi-e	maw	moo	mee	mow	ma-e	mur	mar
no-e	ni-e	naw	noo	nee	now	na-e	nur	nar

Initial  
(Stops)

po-e	pi-e	paw	poo	pee	pow	pa-e	pur	par
to-e	ti-e	taw	too	tee	tow	ta-e	tur	tar
ko-e	ki-e	kaw	koo	kee	kow	ka-e	kur	kar
bo-e	bi-e	baw	boo	bee	bow	ba-e	bur	bar
do-e	di-e	daw	doo	dee	dow	da-e	dur	dar
go-e	----	gaw	goo	---	gow	ga-e	gur	gar

gk and ng have been omitted purposely inasmuch as they are sounds which occur rarely in a beginning vocabulary, and can be developed incidentally.

# Long Vowel Drills

## Initial (Consonants)

for	far	la-e	low	lee	loo	law	li-e	lo-e
thar	thar	tha-e	thow	thee	---	thaw	chi-e	cho-e
gar	gar	ga-e	gaw	gee	goo	gaw	si-e	so-e
shar	shar	sha-e	show	shee	shoo	shaw	shi-e	sho-e
har	har	ha-e	how	hee	hoo	haw	hi-e	ho-e
mar	mar	ma-e	now	mee	mo-e	raw	mi-e	mo-e
nar	nar	na-e	now	nee	no-e	raw	ni-e	no-e

## Initial (Stops)

par	pur	pa-e	pow	pee	po-e	paw	pi-e	po-e
tar	tar	ta-e	tow	tee	to-e	taw	ti-e	to-e
kar	kar	ka-e	kow	kee	ko-e	kaw	ki-e	ko-e
bar	bur	ba-e	baw	bee	bo-e	baw	bi-e	bo-e
dar	dar	da-e	daw	dee	do-e	daw	di-e	do-e
gar	gar	ga-e	gaw	---	go-e	gaw	---	go-e



# Long Vowel Drills

from the foregoing, long vowel  
drills and usable in beginning  
speech and as development

## Final (Continuants)

ofe	ife	awf	oof	eef	ouf	afe	arf	urf
othe	ithe	awth	ooth	eeth	outh	athe	arth	urth
ose	ise	aws	oos	ees	ous	ase	ars	urs
oshe	ishe	awsh	oosh	eesh	oush	ashe	arsh	ursh
ome	ime	awm	oom	eem	oum	ame	arm	urm
one	ine	awn	oon	een	oun	ane	arn	urn
ole	ile	awl	ool	eel	oul	ale	arl	url

## Final (Stops)

ope	ipe	awp	oop	eep	oup	ape	arp	urp
ote	ite	awt	oot	eet	out	ate	art	urt
oke	ike	awk	ook	EEK	ouk	ake	ark	urk
obe	ibe	awb	oob	eeb	oub	abe	arb	urb
ode	ide	awd	ood	eed	oud	ade	ard	urd

oi and u-e have been omitted purposely inasmuch as they are sounds which occur rarely in a beginning vocabulary, and can be developed incidentally.

# Long Vowel Drills

## Final (Continuants)

one	one	one	one	one	one	one	one	one
two	two	two	two	two	two	two	two	two
three	three	three	three	three	three	three	three	three
four	four	four	four	four	four	four	four	four
five	five	five	five	five	five	five	five	five
six	six	six	six	six	six	six	six	six
seven	seven	seven	seven	seven	seven	seven	seven	seven
eight	eight	eight	eight	eight	eight	eight	eight	eight
nine	nine	nine	nine	nine	nine	nine	nine	nine
ten	ten	ten	ten	ten	ten	ten	ten	ten
eleven	eleven	eleven	eleven	eleven	eleven	eleven	eleven	eleven
twelve	twelve	twelve	twelve	twelve	twelve	twelve	twelve	twelve

## Final (Stops)

one	one	one	one	one	one	one	one	one
two	two	two	two	two	two	two	two	two
three	three	three	three	three	three	three	three	three
four	four	four	four	four	four	four	four	four
five	five	five	five	five	five	five	five	five
six	six	six	six	six	six	six	six	six
seven	seven	seven	seven	seven	seven	seven	seven	seven
eight	eight	eight	eight	eight	eight	eight	eight	eight
nine	nine	nine	nine	nine	nine	nine	nine	nine
ten	ten	ten	ten	ten	ten	ten	ten	ten
eleven	eleven	eleven	eleven	eleven	eleven	eleven	eleven	eleven
twelve	twelve	twelve	twelve	twelve	twelve	twelve	twelve	twelve

of and y-e have been omitted purposely inasmuch as they are sounds which occur rarely in a beginning vocabulary, and can be developed incidentally.



Vocabulary possible of development  
from the foregoing long vowel  
drills and usable in beginning  
speech and language development

<u>o-e</u>	<u>i-e</u>	<u>aw</u>	<u>oo</u>	<u>ee</u>
no	I	saw	shoe	see
so	eye	ball	who	me
show	my	tall	moon	knee
toe	by	fall	noon	we
soap	(good-bye) pie	wall	to	she
go	tie	for	two	he
coat	why	fork	tooth	teeth
goat	kite	four	you	meat
more	night	short	spoon	wheel
nose	like	wash		tea
snow	high	washed		bee
	five	auto		hear
	nine	bought		
		caught		

Vocabulary possible of development  
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<u>o-e</u>	<u>i-e</u>	<u>aw</u>	<u>oo</u>	<u>ee</u>
no	I	saw	shoe	see
so	eye	bell	who	me
show	my	tail	moon	three
toe	by	fall	noon	we
soap	(Good-bye) ple	wall	to	she
go	tie	for	two	he
coat	why	fork	tooth	teeth
goat	kite	four	you	meat
more	night	short	spoon	wheel
rose	like	wash		tea
snow	high	washed		bee
	five	auto		near
	nine	bought		
		caught		



Vocabulary possible of development  
from the foregoing long vowel  
drills, etc. (continued)

<u>ou</u>	<u>a-e</u>	<u>ar</u>	<u>ur</u>	<u>oi</u>
bow	may	arm	fur	boy
cow	say	farm	purr	toy
how	pay	hard	purse	
now	take	car	nurse	
mouth	wake(up)	cart	dirt	
mouse	came		dirty	
house	day		hurt	
blouse	(a)way		girl	
flower	game		heard	
	late			
	plate			
	paste			
	eight			

1. Ray S. Goldstein, *The Acoustic Method*, St. Louis, Mo. Laryngoscope Press, 1939, p. 11.





## VIII

### USE OF RESIDUAL HEARING

The idea that a congenitally or adventitiously deaf child may have a remnant of hearing that can be developed by systematic training is not new. As far back as 1761,

Ernaud demonstrated before the Academy of Sciences in Paris a method by which the deaf were taught to differentiate various vocal sounds, but this applied to that selected class of deaf who still had residual hearing and comprehension for vowels and consonants. By means of exercises this investigator was able to develop in such pupils with residual hearing for elementary sounds a hearing for words. In one case, he even obtained hearing for phrases. Ernaud claimed that total deafness did not exist.<sup>1</sup>

In 1802,

Itard, an eminent otologist of Paris, found, in a group of congenitally deaf children, by frequently and regularly repeated vocal sounds called into the ear, that an increased hearing perception could be uniformly developed. In 1805 he carried out a series of careful observations in a class of six deaf pupils. Itard began his acoustic practice with bells, gradually reducing the tone intensity of this source of sound. He then substituted musical tones, the rhythmic beat of the drum, the sustained notes of the flute, and finally, the five elementary sustained vowels and the production of consonants..... His conclusions were as follows: In the one case where the sound of thunder and

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intense gongs were heard before the practice, word-hearing was developed; in the second case where residual hearing for elementary sounds existed, word-hearing was developed; the third case, whose residual hearing was far better than the first two cited cases, did not respond satisfactorily and as an end-result showed less progress than the other two.<sup>1</sup>

Similar experiments with residual hearing were being carried out during the first half of the nineteenth century in Germany and England. After that,

...interest in this form of special education of residual hearing, as advocated so enthusiastically by Itard, Toynbee and others in the early half of the nineteenth century, began to wane. To America belongs the credit for a reawakening of this form of special training of the deaf.<sup>2</sup>

Following are extracts from an address on "The Aural System for the Semi-Deaf" given by J. A. Gillespie, then principal of the Nebraska Institution for the Deaf, before the Third Convention of Articulation Teachers of the Deaf held at New York City, June, 1884:

That a large percentage of our deaf and dumb pupils, so called, have partial hearing is a fact well understood. That but little effort is made to develop this latent hearing is a fact equally as patent. To prove that dormant hearing can be developed, cultivated and used in the education of this class is the object of this paper....

About four years ago my attention was directed to the audiphone as an aid to hearing. I secured a number of these instruments, selected a class consisting mostly of grown

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1 Goldstein, The Acoustic Method, pp. 11-13.

2 Ibid., p. 13.



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pupils, those having some hearing, and drilled it daily from half an hour to an hour at a time for about three months, beginning with single sounds made in quite a loud voice. At the expiration of that time these pupils were able to recognize sounds, words, and a number of sentences....

Two years ago, I organized a class of the youngest semi-deaf children to see what would be the result of a similar course of drill. The progress of this class was even more rapid than the former....

This experiment confirmed me in the belief that the semi-deaf children could be educated through the medium of the hearing if the right methods were employed and if taken young.... That the future has great developments in store in this direction is my firm belief....

Dr. Alexander Graham Bell, who was present at the same meeting, made the following comment:

I have an instrument of that kind [referring to an "audimeter" described by Professor Gillespie] with which I am now making experiments. In 1871 I witnessed experiments made with a hearing tube in the Horace Mann School.

These experiments, it will be noted, were confined exclusively to the semi-deaf.

Since that time progressive educators of the deaf here and there throughout this country have persisted in the idea that the education of residual hearing is not only a possibility but a necessity if the best results are to be attained in teaching the acoustically handicapped. The founding of the Central Institute for the Deaf at St. Louis in 1914 was for the purpose of making research in the development of residual hearing by means of acoustic training with



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amplified sound, and the work pursued there has done much to promote this theory.

Until the beginning of the present century amplification of sound was by means of non-electrical devices. Since the invention of the telephone there has been continuous experimentation for the purpose of finding a means for bringing speech sounds to deafened ears. In fact, it is a well-known fact that Dr. Bell was as much interested in inventing an instrument to aid the deaf as he was in the transmission of sound for the purpose of communication between points distant. The first electrical device was produced by Dr. Ferdinand Alt of Vienna in 1900, and was built upon the principle of the telephone. Improvements in electrical instruments have kept pace with the development of better transmission and reception in the telephone, and in more recent years, the radio, until now the use of the vacuum tube and crystal microphone for improvement in radio has been applied to hearing aids, also, and with such splendid results that the number of those who can be benefited by electrically amplified sound is greatly increased.

It is no longer, therefore, a question as to whether or not residual hearing should be developed. It is now a foregone conclusion that it should be, and that the best means known for the amplification of sound should be suited to each specific case as an aid in the development of better speech and understanding of language. It would be



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now a foregone conclusion that it should be, and that the

best means known for the amplification of sound should be

applied to each specific case as an aid in the development of

better speech and understanding of language. It would be



doing a great injustice to the deaf child not to make use of any residual hearing he may have for the following reasons:

(1) For the purpose of developing a natural voice with inflection, accent and rhythm; and (2) for opening an avenue to the brain by means of sound, which being the natural approach to learning will result in developing a better understanding of language. Development along either of these lines is dependent not so much on the degree of hearing as the type of deafness and mental acuity of the pupil. Hearing to be of use in the acquisition of an understanding of speech must be within the speech range. Hearing outside the speech range can be of use, however, in improving the voice. The better voices that can be developed, and the better understanding of language that can be awakened, the more nearly normal the deaf child will be. To this end it is obvious that every means possible should be used.

An article from the Department of Research at the Clarke School for the Deaf states the following:

Modern methods of research are demonstrating that the majority of small deaf children are partially, not totally, deaf; that they have usable amounts of residual hearing at some pitches or frequencies, if not at all. These remnants of usable hearing will naturally vary greatly in amount and range of frequency in an unselected group of deaf children.

Science has now given us, in the more delicate audiometers, instruments of precision for the diagnosis of the hearing loss of the individual child; it is each year perfecting the amplifying devices by which many sounds can be brought within the range of many partially







deaf children. It remains for educators of the small deaf child to utilize to the full the knowledge and the instruments which science is placing at their disposal. This means that the speech-language development and the education of the small deaf child will gradually tend to approximate more closely that of the hearing child. This trend is apparent in a number of schools for the deaf on both sides of the Atlantic. If education is to keep abreast of the great strides which science is making in the physics of sound, the education of the small deaf child will gradually proceed more and more along normal or partially normal lines.<sup>1</sup>

As soon as it has been determined that a child is deaf, stimulation of remnant of hearing should be begun. This may be done either by teaching the child to recognize the different sounds of bells, whistles, clapping the hands at varying distances, or by listening to the radio, or by both. When recognition of differences in such sounds has been attained, voice should be used. The human voice without amplification is the best means of developing a natural speech provided there is hearing enough to respond. If, however, the child does not respond to voice when used close to the ear, any device that will amplify the voice sufficiently to convey an idea of its sound will be most helpful. Audiotubes of various manufacture amplify the voice enough in many cases to produce normal voices and true vowel sounds. The child can also hear his own voice. If commercial audiotubes

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1 Ruth P. Guilder, M.D., and Louise Hopkins, B.A., Program for the Testing and Training of Auditory Function in the Small Deaf Child During Preschool Years, Reprint No. 440, Washington, D.C., The Volta Bureau.







are not available, smooth-surfaced paper drinking cups of various sizes from which the bottom has been removed may be useful. With the small end placed to the child's ear, the normal voice applied to the large end is carried directly to the ear, and is amplified sufficiently to make speech more intelligible to one with a limited amount of hearing loss. A quart-size paper milk bottle or even a pasteboard mailing tube has been used successfully in some cases.

If after repeated effort over a period of time of speaking directly into the ear or by use of any one of the devices mentioned above, the child gives no evidence of sound perception, steps should be taken toward securing a properly fitted electrical aid. After the examination by a competent otologist and the audiometer test mentioned above to discover the extent of hearing loss and range of residual hearing, an instrument should be secured suited to the type of deafness which the child has. Here arise the much mooted questions as to the age at which to begin the use of an electrical hearing aid and the extent of hearing loss that will respond to such amplification. Increasingly it is becoming recognized that as soon as it has been determined that the child cannot respond to vowel sounds spoken close to the ear or through a non-electrical amplifier, even as early as two and a half or three years he should be supplied with an electrical device, and that the extent of deafness should be no deterrent. For the young child a desk model with double ear phones is



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device, and that the extent of deafness should be no deterrent.

For the young child a desk model with double ear phones is



preferable. At first the periods of listening should be of but a few minutes duration repeated at intervals throughout the day. Gradually the length of time may be increased until the hearing aid can be worn during most of the formal lessons, or at least during the oral lesson periods.

It is important to keep in mind that in educating residual hearing for speech purposes we are not trying to develop an understanding of speech through the ear sufficient to make the person independent of lip-reading. What we are trying to do is to bring to the deaf child an idea of the human voice that he can imitate, and also to awaken and stimulate the language center of the brain in the normal, or as near the normal way as possible, that is, by speech sounds. Incidentally, lip-reading will be facilitated. Hearing people understand speech better if they are looking at the speaker, especially if the speaker is at a distance. Conversely, the deaf person who can hear the sound of the voice will do better lip-reading than if he can hear no sound. The profoundly deaf child who cannot differentiate between one vowel sound and another, and yet can hear the sound of the voice, has a better chance for learning good speech than he would if he did not have the benefit of even so small an amount of residual hearing. This fact greatly increases the number of those who will be benefited by the use of an electrical hearing aid, and leaves the number of those who cannot be so benefited very small indeed.



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lessons, or at least during the oral lesson periods.

It is important to keep in mind that in educating

residual hearing for speech purposes we are not trying to develop an understanding of speech through the ear sufficient to make the person independent of lip-reading. What we are

trying to do is to bring to the deaf child an idea of the human voice that he can imitate, and also to awaken and stimulate the language center of the brain in the normal, or as near the normal way as possible, that is, by speech sounds. Incidentally, lip-reading will be facilitated. Hearing people understand speech better if they are looking at the speaker, especially if the speaker is at a distance. Conversely, the

deaf person who can hear the sound of the voice will do better lip-reading than if he can hear no sound. The profound-ly deaf child who cannot differentiate between one vowel sound and another, and yet can hear the sound of the voice, has a better chance for learning good speech than he would if he did not have the benefit of even so small an amount of residual hearing. This fact greatly increases the number of those who will be benefited by the use of an electrical hearing aid, and leaves the number of those who cannot be so benefited very small indeed.



If the pupil has as much as fifty per cent of normal hearing, it is quite probable that he will learn to recognize vowel sounds when pronounced close to the ear with a minimum of practice, provided the residual hearing is within the speech range. He probably will not hear the breath consonants, and will confuse the voiced consonants that are similar; e.g., b, d, g; m, n, ng. However, he will learn words in which these sounds occur, and will associate the right consonant sound with certain vowels, such as boy, girl, or he will see the difference between the two by means of lip-reading. While good speech can be developed in such a case by speaking close to the ear, a hearing aid is advisable in order to facilitate the acquisition of language as well as speech by means of sound plus lip-reading. This is the type of child that may be able to carry on his education with hearing children, provided a good foundation of speech and an understanding and use of language has been developed before school age.

It is impossible to say how much the child with less than forty per cent can learn to hear even with the use of a hearing aid; but experience shows that if a child can hear something that represents to him a voice, the hearing aid is of value for the improvement of voice. For this reason systematic training should be persisted in throughout the school years even in the case of the profoundly deaf. It is one of the most important helps in speech building, and







surprising results have been attained when this has been done. The procedure for development of hearing will be the same as for those who respond more easily, the speed and extent of learning depending not only upon the amount of hearing but also upon the type of deafness.

Residual hearing may be developed by use of the Exercises prepared at the Central Institute for the Deaf in St. Louis, which are based on the Oskar Wolf Table of Distance of Audibility of Speech Elements as Heard by the Normal Ear," printed in The Acoustic Method by Dr. Max A. Goldstein.<sup>1</sup> Or a method may be built up using the Fletcher chart<sup>2</sup> which records the consonants and vowels according to the per cent of times the sound is misinterpreted.

Best results are usually obtained by using a low-pitched voice. Speech should be clear, distinct and well inflected, remembering that the child can give back no better speech than that for which he receives the pattern. It also should be slow enough at the outset to permit time for the impression to reach the center for the interpretation of sound. Part of the practice for development of residual hearing should be carried on with the child watching the lips while listening to the speech through his hearing aid. In this way the eye will be trained to coordinate with the

1 Pp. 29-41.

2 Harvey Fletcher, Speech and Hearing, New York, D. Van Nostrand Company, Inc., 1929.

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ear in the interpretation of speech sounds, and to supplement subconsciously such sounds as cannot be heard.

It will be found advisable to conduct the drills outlined in the foregoing sections with the help of whatever amplification is necessary in order to accomplish the objectives of good speech with the greatest ease.

As soon as the hearing has been stimulated sufficiently to interpret the vowel sounds which are most easily heard, these same sounds should be combined into syllables and then into words and simple sentences, at first using a few words combined in as many ways as possible. When a degree of proficiency has been attained, introduce Mother Goose Rhymes, or any short verses for children, choosing those which contain some, at least, of the vowels which have been learned. Let the child watch the lips while listening to these "stories" and then let him listen without looking. It is not to be expected that all the words will be heard, but the rhyme should be repeated many times before the child is expected to give it back, even in part. In other words, follow as nearly as possible the procedure used in reading to hearing children. This not only stimulates the hearing; it teaches language sequence, and improves voice quality.

Reading material should be chosen with regard to the child's mental age and interest. Let the child look at the book as you read. If there are pictures, as it is hoped there will be, point out things of interest and explain them.







The child's interest should be kept up and the exercise should be stopped before the point of fatigue is reached.

It will require a great deal of time and patience to persist in the training of residual hearing, especially if the remnant is small; but the result will more than repay the effort.

To summarize, it is to the advantage of the deaf child both for speech and language development to make use of whatever remnant of hearing he may have, even though tests indicate profound deafness, either by speaking directly into the ear, by using an audiotube or, if there is not enough hearing to make this method serviceable, by means of electrical amplification.

all of the information he will acquire must be directed specifically to him, and will be absorbed by him only through conscious effort on his part. A deaf child in the home is a challenge to the whole family. He must not be catered to; but must have his duties in the home just as do his hearing brothers and sisters. He must learn the give and take of life, and should be taught in every way to be a good member of society. While there must be no favoritism because of his deafness, there must be sympathetic understanding, and pains should be taken to make sure that he knows what is required of him.

The great determination on the part of the parents of a deaf child should be to make every effort to fit him in all ways to take his place successfully in the hearing world.

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## IX

### WAYS IN WHICH THE HOME SHOULD CO-OPERATE WITH THE SCHOOL

The need for co-operation in the home cannot be over-stressed. The measure of the child's success in the oral and aural method of instruction is in the degree to which the home co-operates intelligently. The hearing child gets a large part of his education by subconsciously assimilating information through the ear. This avenue being closed to the deaf child, all of the information he will acquire must be directed specifically to him, and will be absorbed by him only through conscious effort on his part. A deaf child in the home is a challenge to the whole family. He must not be catered to; but must have his duties in the home just as do his hearing brothers and sisters. He must learn the give and take of life, and should be taught in every way to be a good member of society. While there must be no favoritism because of his deafness, there must be sympathetic understanding, and pains should be taken to make sure that he knows what is required of him.

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in spite of his handicap. As soon as there is any indication, therefore, that a child may be deaf, there should be the examination by a competent otologist, and steps taken to find the hearing aid best suited to the type and extent of deafness, as suggested on page 72. Advice of a well-trained teacher of the deaf should be sought, also. If no teacher is available for instruction, a suitable school for the deaf should be found if the child has more than a fifty per cent loss. If there is fifty per cent or more of hearing an effort may be made to teach the child a hearing vocabulary, with the idea of sending him to a school for hearing children. A private school, where the classes will be small, and an agreement can be made for the teachers to give special attention to his problems, would be preferred, but if not, education can be carried on in a public school. In either case it will be necessary that the teachers understand that they will have to make some adjustments for the deaf child, and be willing to do so. The following suggestions are offered to guide in the development of residual hearing in such a case, or to help in the case of a deaf child when for some reason or other it is impossible to send him away to school.

Train what residual hearing there is, no matter how little there may seem to be, for the reasons explained in the section on "Use of Residual Hearing." Do this, even if tests show that there is no residual hearing. Statistics



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have revealed that the majority of children born deaf have sound perception that may be stimulated and made of service. Even deafness due to meningitis has been known to yield to continued stimulation over an extended period.

The deaf child should be taught to watch the lips of every one with whom he comes in contact. Too often the child's learning of lip-reading is confined to the mother or other person in the home who undertakes to act in the capacity of teacher. When a third person enters the conversation, the deaf child's attention usually wanders to something else. A word or look from the mother can bring his attention back to the speaker's lips. Persistent watching of all lips will help toward a natural, flowing speech. At the outset, in order to teach the child to concentrate attention on the lips, a piece of colored paper out of which a space has been cut just large enough to show the mouth to advantage, but with the rest of the face, up to the eyes, concealed, will be found very helpful. It will also prevent exaggeration of lip movement, which is always a hindrance to good speech. Different colored papers may be used for variety.

There should be a great deal of sense training. This helps speech by coördinating muscles, educating memory, developing power of observation and concentration. Material such as one would use with pre-school hearing children is serviceable for this purpose.

The child should be encouraged to imitate what he



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sees and hears in the speech of others; but unless help is to be given by one specially trained, no attempt should be made to teach speech other than in this informal way or with the use of a hearing device. However, as soon as he starts to school, or has the help of a trained teacher, and learns the elements and a few combinations, he should be held responsible for what he knows. For this purpose large charts may be made which will record each new element as learned. There should be one chart for consonants and one for vowels hung in a conspicuous place where they can be referred to readily when a mistake is made in a speech sound. At such times he should be required to try to recall the correct production of the sound in question and should be told only when one is sure that recall is impossible. It is most important that he be held responsible for what he knows, for a speech memory must be created.

If a parent is to be of help to the child as he advances in his speech work, she must know just what to look for, and train her ear to listen correctly. It is important to keep in mind the difference between consonant sounds that are breath only, and those that are voice; and to remember that voice comes through the nose in producing the sounds of m, n and ng, as explained in foregoing sections. The tongue, too, must be watched, and care must be taken that for all vowel sounds the tip of the tongue is close to the lower front teeth.



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As the child advances in speech, unfinished endings must be watched for. Since the child will give back only what he sees unless otherwise instructed, he may say fir instead of first, inasmuch as the st ending does not show on the lips. The same is true of words ending in ly: e.g., slow for slowly; me, or mei, for many. Say, "Did you finish the word?" or write on a blackboard or pad the word as he said it, and have him correct the written form and then say it several times, first while looking at the written word and then from memory. When he says a sentence incorrectly, say, "Write that on the board." If he cannot correct it himself, help him. Have him read the sentence, then brush it off and have him repeat it from memory.

Train the child to be alert and quick in his response. Don't let him dawdle. Make a game of trying to get things done in a given time. Alertness is a very important element in a deaf person, not only for speech purposes, but for all other phases of his life. Poor habits of attention, and slowness of response are much more detrimental in the case of a deaf child than of a hearing one, and unless training in these respects is begun early in life, it will be practically impossible to make up for the deficiency later on.

A radio attachment, designed by makers of hearing aids, to stimulate hearing as well as to give enjoyment should be part of the equipment of every home where there is a deaf







child. This will amplify the sound to the deaf one but at the same time allow the family to hear at a normal volume.

The hearing aid used in the home should be a desk model preferably equipped with double ear phones. Suggestions for its use in the development of speech and hearing will be found under "Use of Residual Hearing."

Since the secrets of success in creating a speech memory are recall and repetition, the child should be required to depend upon himself for recall as soon as he has been able to give an element, syllable, word or sentence correctly; and then ways should be found to give opportunity for repetition, bringing up the point again and again in as many different combinations as possible, until the speech or language form becomes automatic. Only so can he have natural fluent speech.

Finally, it may seem trite to say that the deaf child must learn to obey. There is no subject in which obedience is more important than in speech. The child must be willing to do things his teacher's way, not his own. Often a child's unwillingness to follow instructions has resulted in speech failure that otherwise might have been successful. In this the home can help immeasurably. There are many things which a child may do his own way that will develop his initiative; but speech, as has been said, is according to a pattern which must be followed within clearly





defined limitations in order to be intelligible. Therefore, it is all important to teach the child obedience.





## SUMMARY

It will be noted from the foregoing that the teaching of speech to the deaf does not require an elaborate set-up nor a multiplicity of drills. Rather it requires a clear understanding of certain principles, and certain techniques by which those principles may be applied. The aim should be to develop combinations of elements that will lead to the building of a usable vocabulary as soon as possible.

It will be noted, also, that with the exception of m, n and ng, p, t and k, the consonants are taught in combination with a vowel sound; that the difference between breath, voice and voice through the nose in these groups of elements that look alike in lip-reading, but are pronounced differently, must be kept before the pupil continually; that if the principle of "the hold" is well established it will obviate many faults often found in the speech of the deaf; that a clear fundamental tone, directed to a focal point, is necessary for understandable speech; that drill should continue until speech has become automatic; and that every effort should be made to develop a memory of speech sounds felt and, wherever possible, a memory of speech sounds heard, by use of a mechanical device if necessary, in order to facilitate the learning of both speech and its use in language.





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